



www.optimizeias.com

DAILY PRELIMS NOTES COMPILATION MARCH 2024

*To be the best
Learn from the best*

04/01/17 Civil Services Marksheet
Current Time & Date: 08:24:05 AM (Tue, 04-Jun-2017)

UNION PUBLIC SERVICE COMMISSION
MARKSHEET

Civil Services (PRELIMINARY) Examination, 2016

Roll Number	0029983
Name	SANTOSH PANDEY
Marks Obtained	
Paper I	144.66
Paper II	107.50

REMARKS : QUALIFIED FOR CS(MAIN) EXAMINATION,2016

DISCLAIMER : The contents of this site is infomratory in nature. You are advised to verify the same from Commission's office.

SANTOSH SIR
CRACKED ALL 6 PRELIMS



Contents

Economy	14
SEBI asks small and mid-cap funds to disclose more about risks to investors	14
Newly Permitted Commodities for Derivatives Trading by MoF.....	15
Inclusion of Indian bonds in the Bloomberg Emerging Market (EM) Local Currency Government Index.....	18
SEBI relaxes FPI disclosure norms	19
Shrinking Board Sizes and Corporate Governance: Key Insights	22
Impact of Election Schedule on Nifty and Bank Nifty Options	25
Simplifying Claims Settlement: IEPFA's Initiative	26
Why did SEBI ask fund houses to stop ETF inflows?	27
Hong Kong lawmakers pass new national security law, giving government more power to curb dissent	28
Market capitalisation.....	28
Scrutiny on De Minimis Trade Rule: Impact on Online Shopping and U.S. Economy.....	29
India-EFTA Free Trade Agreement	31
EoUs and SEZs to get RoDTEP sops until September 30	32
India's Proposal on Moratorium on Customs Duties for E-Transmissions.....	35
India's Pursuit for Lowering Cross-Border Remittance Costs.....	36
India's Pursuit for Lowering Cross-Border Remittance Costs.....	38
Mauritius: Shifting Perspectives on Taxation and Investment.....	39
Revised Regulatory Framework for Bharat Bill Payment Systems (BBPS).....	41
NBFC-MFIs Proposal to Raise Household Income Limit for Micro Loans	43
Amit Shah Inaugurates National Urban Cooperative Finance and Development Corporation Limited	44
RBI Tasks NPCI Bharat BillPay Ltd. for Interoperable Internet Banking System	46
Reserve Bank of India (RBI) Directive on Card Networks.....	47
Global Banking Regulators Crack Down on G-SIBs.....	49
RBI's Sell/Buy Swap to Address Liquidity Ahead of Tax Outflows.....	50
Japan Nears Interest Rate Hike: Financial Markets Gear Up for Transition	52
Review of NBFC Categorisation by RBI: Potential Impact and Significance.....	53
Banking Crisis Aftermath: Considerations for Strengthening Banking sector	56
Bank of Japan Raises Interest Rates After 17 Years	57
India's Proposed Maritime Development Fund	58
Competition Commission of India (CCI) Orders Probe Against Google	60
EV policy paves way for Tesla entry	61
India's GDP Growth in Q3 2023-24	63
Indian Start-ups Urge CCI to Intervene in Google App Removal Dispute	65

Income and Wealth Inequality in India	66
Aspects of inequality of India.....	67
Employment scenario in India grim, says ILO report.....	70
State of employment in India: What a new report says about youths and women, concerns and caution.....	71
Environment.....	73
On sustainable building materials	73
Worrying biodiversity loss in Finnish coastal waters: report	75
Fighting warming: when gasses are contraband.....	76
Warming up to climate change: Why do global sea surface temperatures matter?.....	77
The need to curb black carbon emissions	78
How much should develop countries pay for climate action?.....	80
Researchers call Australia carbon credit scheme a ‘catastrophe’	81
Kerala government declares wildlife attacks a State-specific disaster	81
Resorts near tiger reserves have turned choice wedding destinations: Supreme Court	82
Meant to reduce stress on big cats, why safari parks may be a double-edged sword.....	83
Bare act	84
Star-rating for state environment bodies not operational yet, Ministry tells NGT	85
International Big Cat Alliance headquarters will be in India; the Centre allocates Rs 150 crore	86
Planetary Boundary pioneer Johan Rockstrom wins 2024 Tyler Prize for environmental achievement.....	86
Countries hope to bring BBNJ or High Seas treaty into force by 2025; only 2 have ratified it so far	88
The problem of equity in IPCC reports.....	89
IPEF: India to join US-led co-operative work programme on carbon market	90
Will global forest expansion hit tribals?	91
Meghalaya’s Byrnihat most polluted ‘city’ in India	92
Higher levels of heavy metals in areas around the Bhopal gas tragedy site: Government report.....	93
Bihar's Begusarai, ‘world's most polluted city in 2023’; India ranks 3rd globally: Swiss report	93
Ministry of Environment tightens rules on bioplastics.....	94
Over 24,000 birds from 66 species recorded during Tamirabharani Waterbird Count	95
Trees in Corbett fell prey to greedy nexus, says Supreme Court	95
Supreme Court stops Assam’s move to withdraw notification of Pobitora Wildlife Sanctuary.....	96
Ready proposal to demarcate Dulung-Subansiri elephant corridor, Union environment ministry tells Arunachal, Assam	97
What Is Kuttanad Farming?.....	98
ZSI names a newly discovered sea slug after President Murmu	98
India’s leopard population rises to 13,874; M.P. on top.....	99

Mating calls indicate endangered Hanguls are on a comeback trail	100
Children fall to hunger in Gaza as Israeli siege cuts off supplies- 'khubaiza.'	100
7396 golden langurs in India, reveals survey	100
Centre contemplating a ban on wolf dogs. But what about the hybrids roaming India's wilds?	101
India's sharks and rays: an ancient species on the brink of extinction	102
Right whales may never breed after run-ins with fishing gear	103
An Illustrated Guide on the Butterflies and Moths (Lepidoptera) of India	104
Uttarakhand to translocate four tigers to Rajasthan says official	105
What are the new rules for elephant transfer	105
Saving India's wild 'unicorns'	107
Power threat to the bustard	108
Fish otolith ornaments make market debut.....	109
Geography	110
2023-24 El Nino among five strongest on record, will continue fueling heat in 2024: WMO	110
Spring season 'disappearing' in many States, shows study.....	110
One of the major gaps in our weather observational system is over the oceans: Elena Manaenkova	111
Tropical cyclones of higher intensity demand a new category.....	112
Cabinet approves royalty rates for mining of 12 critical and strategic minerals	113
Offshore Mineral Blocks for Auction.....	114
Launch of Exploration Licence for Critical and Deep-Seated Minerals by the States of Karnataka and Rajasthan - A First in the Country	117
Dahej: Major reason for large semiconductor investments in Gujarat	118
China lithium boom slows as sagging prices batter high-cost miners	119
Australia's iron ore miners face falling Chinese demand.....	119
India's 'protected' basmati varieties renamed & cultivated in Pak, IARI demands legal action	120
India in undersea race to mine world's battery metal.....	121
Brazil heading to a rare sequence of increasing coffee crop output	123
India's 'protected' basmati varieties renamed & cultivated in Pak, IARI demands legal action	123
Robusta coffee price touches all-time high amid global shortage.....	124
Sensing China threat, India joins race to mine new sea patch.....	126
What is the economic cost of Baltimore's bridge collapse?.....	127
Star dunes	128
Indigenous Greenland women sue Denmark over forced contraception.....	129
A tribe in the Western Ghats in need of a lifeline	130
Where names indicate the order of birth in a family	131

India's birth crisis: What the Lancet forecast of fertility rate dip to 1.29 by 2050 means.....	132
National dam panel to examine Kaleshwaram project on March 6	133
Water crisis in Bengaluru linked to urbanization of Kodagu	134
Water levels less than 25% in many major dams in the south	134
Here is why Ladakh needs the Sixth Schedule and statehood	135
Why INS Jatayu, India's new naval base in Lakshadweep, matters.....	136
About India's First Under-River Metro Tunnel	138
Backed by BrahMos, the Navy's Minicoy base to keep watch over the Arabian Sea.....	138
Sela Tunnel	139
BRO connects strategic Nimmu-Padam-Darcha road in Ladakh.....	139
ICCC: Integrated farm data dashboard for customized solutions.....	140
NASA touts research in 'space labs' to fight cancer	142
Fourth mass coral bleaching	142
Bengaluru water crisis: Is the southern metropolis heading towards Day Zero?.....	143
History.....	144
Cuttack Rupa Tarakasi, Banglar muslin get GI tag.....	144
GI recognition for Narasapur crochet lace craft revives hopes of struggling artisan	145
Madhya Pradesh HC orders ASI survey of Bhojshala complex.....	146
GI tag for Majuli masks of Assam: History, cultural significance of the centuries-old art form.....	146
What is Cuttack's famed silver filigree work, which recently received GI tag.....	147
Ministry of Minority Affairs approves 'Centre of Jain Manuscriptology' (GUCJM) at Gujarat University.....	148
Son's tribute to father, 'piece of Gujarat in Delhi': Story of ChausathKhamba.....	149
T M Krishna conferred Sangita Kalanidhi.....	149
Rising from the ashes.....	150
The Archaeological Survey of India will 'delist' some 'lost' monuments. What's happening, and why?	150
Kalamandalam opens doors for boys to learn Mohiniyattam.....	152
Lalit Kala Akademi chief's powers curbed by Culture Ministry	153
Carnatic Music recent controversy	154
T.M. Krishna The dissident vocalist.....	156
Sabarmati Ashram Redevelopment Plan.....	157
'Regrettable to criticize T M Krishna' says Tamil Nadu CM MK Stalin; derides criticism of Periyar by musicians.....	158
Dispersal out of Africa may have occurred during arid period.....	159
Union code 0001: How a village seeded India's White Revolution.....	159
IR.....	160

India and South Africa block attempt to include ‘investment facilitation for development’ agreement at WTO meet	160
2023 Was Deadliest Year for Migrants in A Decade: UN	160
Ensure Pakistan does not divert loans to foot defence bills: India to IMF	161
Call for Review of TRIPS Agreement: India's Joint Statement at WTO	163
IMF’s bailouts to Pakistan	164
Sri Lanka likely to secure six-year moratorium, lower interest on debt owed to India, Paris Club	165
UN passes resolution calling for ceasefire in Gaza during Ramadan.....	166
WTO’s investment facilitation negotiations are not illegal	167
US court asks India to pay \$132 million to Deutsche Telekom in Devas Antrix case	168
Many countries yet to fully implement steps to prevent misuse of virtual assets, says FATF	168
The Italian court ruling against returning sea migrants to Libya.....	169
Yaounde Declaration: Health ministers of 11 African countries commit to end malaria deaths	169
India-EFTA Trade and Economic Partnership Agreement.....	170
Experts report Nicaraguan ‘systematic human rights violations’ to UN council.....	172
How the development of Agaléga figures in India’s vision for its maritime neighborhood	173
Rajya Sabha member, team meet rebel Arakan Army inside Myanmar, discover poor condition of Kaladan project on Myanmar side	174
Sudanese seek alternatives as civil war hits fuel supply	175
Haitian crisis.....	176
EU will open sea corridor to send aid from Cyprus to Gaza amid famine fears.....	176
Burkina Faso youth join fight to end female genital mutilation	177
Humanitarian crisis in Haiti as the Caribbean’s most populous country may have fallen to armed gangs.....	178
China, Iran and Russia stage joint naval drills in the Gulf of Oman.....	179
Warring tribes in Papua New Guinea sign ceasefire deal	179
What is the Darien Gap? And why are more migrants risking this Latin American route to get to the US?	180
Burkina Faso, Mali & Niger hint at a new west African currency: what it’ll take for it to succeed.....	181
The flaring conflict in eastern Congo.....	182
Over 50 million people may be food insecure in eastern Africa, warns WFP	183
Maintaining maritime security in the Western Indian Ocean	184
On the mass kidnappings in Nigeria	185
Who are the Majeed Brigade, the Baloch militants who carried out the Gwadar attack?	186
At least 69 Rohingya refugees rescued after boat capsizes off Indonesia	186
HC strikes down UP madrasa law, says put students in regular schools.....	187
Putin says gunmen who raided Moscow concert hall tried to escape to Ukraine. Kyiv denies involvement.....	188

Operation Sankalp	188
Chad junta’s main opponents barred from presidential vote	189
Ukraine says it hit two Russian warships in strikes on Crimea	190
El Nino impact leaves Malawi and region on the edge of a hunger crisis	191
Why does the weakness of low durability dog newer vaccines?	192
For the IS, Russia is an enemy that destroyed its plans in Syria	192
U.K. issues online ads to deter illegal Channel crossings	193
Global Resources Outlook 2024	194
India ‘one of the worst autocratisers’: V-Dem report on democracy	195
Topic no. 26 – India’s Rankings in Human Development and Gender Inequality	195
Households across the world waste 1 billion meals a day, says UN report	197
Polity	198
Mask names of those acquitted in criminal cases from digital records, HC tells media	198
A living will, so the terminally ill can avoid the indignities of prolonged hospital care	198
India top’s Internet shut down	199
Minimum age to cast postal ballots hiked to 85 years	199
Shiv Sena row Supreme Court asks whether Maharashtra Speaker contradicted verdict	200
What it will take to have simultaneous elections in India	201
Lok Sabha Election Dates 2024: Voting to kick off on April 19, will be held in 7 phases; results on June 4	202
Election Commission introduces vote-from-home for citizens aged 85 and above	203
How House terms and poll schedules are decided	205
On campaigning in the name of religion	206
As Kejriwal becomes first sitting CM to be held, a look at ex-CMs’ arrests: Soren to Jayalalithaa to Lalu	207
Sort out differences on financial issues, SC tells Kerala and Centre	208
Why the Supreme Court overturned its 2018 decision, which set a time limit on courts’ stay orders	208
Central Consumer Protection Authority (CCPA) Advisory on Endorsing Illegal Betting	209
Two key RTI portals under ‘emergency maintenance’	211
SC seeks T.N. govt.’s response to HC order on child porn	212
CAA: Issues in the legal challenge to the law	213
Anti-piracy Act has been a great enabler: Navy chief	214
Murmu presents President's Standard and Colors to four IAF units	214
Advisory to airlines by FSSAI	215
EC quits, Commission down to one; PM panel to meet next week to fill vacancies	217
Centre ensures place for Madiga member in Scheduled Caste panel	218
On CEC’s solitary vigil, Supreme Court had said ‘two heads better than one’	219

Public Health Foundation of India surpasses Harvard, bags second place in global rankings for schools of public health	220
President appoints former IAS officers Gyanesh Kumar, Sukhbir Singh Sandhu as new Election Commissioners	221
Rajya Sabha polls BJP gains in U.P., Himachal Pradesh amid cross-voting	221
Immunity won't protect legislators taking bribes to vote in Parliament from criminal prosecution; Supreme Court	222
Kerala challenges withholding of Presidential assent to State bills in Supreme Court	223
Schemes	224
Workshop on 'Count of Pastoralists and their Livestock in 21st Livestock Census'	224
Cabinet Approves Ambitious India AI Mission to Strengthen the AI Innovation Ecosystem	224
Center issues directive to prevent tailgating at airport e-gates	225
Cabinet approves Uttar Poorva Transformative Industrialization Scheme 2024	226
GeM Encouraging Start-ups and Small Enterprises	227
Nutritional crisis: India has most 'zero-food' children at 6.7 million; third highest prevalence among 92 LMICs	228
Railways plans to develop multi-modal transport hubs	230
PM launches Pradhan Mantri Samajik Utthanevum Rozgar Adharit Jankalyan (PM-SURAJ) portal	230
Certification of Railway Stations as Eat Right Stations by FSSAI	231
Department of Consumer Affairs conducts Stakeholders Meeting on Right to Repair Portal India	233
Science and tech	233
Undersea cable disruptions expose India's crucial telecom vulnerability	233
Tired of spam or fraud calls? File a complaint on	234
AI has a big and growing carbon footprint, but algorithms can help	235
Why ASML's new chip-making machine is a scientific marvel	236
Why Anthropic calls the new Claude 3 its 'most intelligent' AI model yet	237
AI knowledge consortium formed by 12 organisations	238
As Big Tech scrambles to meet EU rules, investigations seen as likely	239
Meet Pi, the world's 'friendliest' chatbot powered by the new Inflection-2.5 LLM	240
A (very) basic guide to artificial intelligence	241
Musk to 'open source' his Grok chatbot to tackle rival ChatGPT	242
Meet Devin AI: the world's 'first fully autonomous' AI software engineer	242
Why self-censorship of political speech could be the future normal for AI platforms	243
What is SIMA, Google Deepmind's new AI that can play video games with you	243
Why the B200 Blackwell chip will consolidate Nvidia's stranglehold over the AI market	244
Elon Musk's Neuralink shows first brain-chip patient playing online chess	245

Digital financial frauds in India: a call for improved investigation strategies	245
How are semiconductors fabricated?	247
Why India urgently needs a legal framework for genomics.....	248
Scientists genetically modify ‘sexual’ fruit fly to reproduce asexually	249
Chinese dual-use cargo heading to Pakistan seized	250
Tri-service exercise 'Bharat Shakti' to demonstrate prowess of indigenously manufactured equipment	251
All about India’s indigenous fifth-gen fighter jet Advanced Medium Combat Aircraft (AMCA), and why it is important	252
One missile, many weapons: What makes the latest Agni-5 special?.....	253
With Agni V test, India makes the MIRV leap	254
EX TIGER TRIUMPH – 24.....	255
After 30 years, India began to make Penicillin G	255
Why obesity, undernutrition high in India: what a Lancet study says	256
A bold step towards a cervical cancer-free future	257
Novo valuation surpasses Tesla on experimental obesity drug data	258
FAO publishes first national report on AMR surveillance in India’s fisheries, livestock sectors	259
Union Health Ministry launches National Action Plan for Prevention and Control of Snakebite Envenoming in India	260
Govt. issues marketing code for pharmaceutical firms	261
Gut microbes that digest cellulose are declining, especially in industrialised nations.....	261
Indian team uses repurposed drug to treat oral cancer subtype	262
International body recommends more sensitive test to indicate risk of developing diabetes.....	262
Why Karnataka has banned food coloring used in gobi manchurian and cotton candy	263
Vaccine for dengue may be out in markets by mid-2026, says IIL.....	264
Axis Bank to support Tata Memorial-supported National Cancer Grid with ₹100 crore contribution	265
Eliminating diseases, one region at a time	266
US surgeons have transplanted a pig kidney into a patient	267
Trials on for seven weight-loss drugs knocking on Indian doors	267
Activist write to pm highlighting shortage of vital anti-TB drug	268
Anaemia prevalence in eight states found to be overstated.....	269
To curb illegal trade, the health ministry tell states to plug gaps in compiling data on organ donors	270
Bharat biotech commences clinical trials of Spanish tuberculosis vaccine in India	270
Hepatitis B is a public health concern in India; but very few know about its transmission, effects & vaccination	271
Inaccessibility and cost cripple efforts to treat sickle cell disease.....	272
India TB Report-2024: Missing cases shrinking, 95% got treatment in 2023.....	273

ICMR set to bring in evidence-based norms for lung cancer management	274
WHO launches ‘CoViNet’ — a global laboratory to monitor emerging coronaviruses.....	274
Naturally occurring bile acid can blunt statin-induced diabetes.....	275
PM Modi launches hydrogen-powered ferry: features, significance.....	275
Bengaluru bomb blast: What are improvised explosive devices, or IEDs?	276
In snake genes, study finds they evolved 3x faster than other reptiles.....	277
Resonance: a tendency to move in step	279
Significance of Lab-Grown Diamonds in Power Electronics	279
What is ‘dry ice’ at the centre of the Gurugram restaurant incident?	282
12 security agencies to use indigenously developed explosive detectors	282
In Gujarat, harnessing the value of dung to boost farmers’ income.....	282
Specialized Cylinders for Hydrogen Storage.....	284
Panel recommends ban on ‘ferocious dogs’	287
Lead-acid batteries most successful example of circular economy.....	287
The big promise of small-scale LNG as fuel for India, with first SSLNG plant commissioned.....	289
Target of 25-cr. Smart meters by 2025 to be missed by long mile.....	290
The status of India’s nuclear programme.....	291
How is nuclear waste generated?.....	292
FBR and energy security	293
Nuclear energy: fixing the finance.....	295
What will Gaganyaan change for India?	296
Meet MethaneSAT, a satellite which will ‘name and shame’ methane emitters.....	297
Why is ISRO building a second rocket launchport in Tamil Nadu’s Kulasekarapattinam?.....	298
Centre to rope in ISRO to provide Internet in 80 remote tribal villages.....	299
Oldest ‘dead galaxy’ yet is spotted by James Webb Telescope.....	300
What the success of Gaganyaan could mean for Indian science.....	300
Why has India developed an atmospheric testbed near Bhopal?	301
IceCube: the big, chill neutrino-spotter	302
VSSC, ISRO develop the multi-purpose app SAKHI to assist the Gaganyaan crew	303
T.N. start-up to launch its first rocket on Friday.....	304
NASA craft that diverted space rock also dented it.....	304
ISRO successfully conducts second Pushpak RLV landing experiment.....	305
IAU approves ‘Station Shiv Shakti’ as name for Chandrayaan-3 landing site.....	305
Apple, Google, Meta targeted in EU’s first Digital Markets Act probes	306
Agnikul’s maiden test launch of Agnibaan Sorted mission postponed	307

OPTIMIZE IAS



LAQSHYA 2024

TEST BASED MENTORSHIP FOR CSE PRELIMS 2024

UNION PUBLIC SERVICE COMMISSION
MARKSHEET

Civil Services (PRELIMINARY) Examination , 2016	
Roll Number	0029983
Name	SANTOSH PANDEY
Marks Obtained	
Paper I	144.66
Paper II	107.50

REMARKS : QUALIFIED FOR CS(MAIN) EXAMINATION,2016

DISCLAIMER : The contents of this site is informatory in nature.You are advised to verify the same from Commission's office.



Santosh Sir
CRACKED ALL 6 PRELIMS

- NCERT LEVEL TEST - 10
- ADVANCED LEVEL TEST - 15
- MONTHLY CURRENT AFFAIRS TEST - 15
- ENTIRE YEAR IMP QUESTION TEST (SUBJECT-WISE) - 8
- FULL LENGTH STIMULATED TEST - 7
- C-SAT Test - 10
- TOTAL NO. OF TEST - 65**

FREE CSAT MENTORSHIP

Many questions in CSE PRELIMS 2023 Paper were from most predicted Questions of LAQSHYA 2023



Ishita Kishore, AIR 1 CSE 2022
LAQSHYA Test Series student

Feedback
→

Test was great. definitely better than any other coaching centres

Team Optimize IAS +91 94433 88738

What do our CSE 2022 TOPPER say?

Thank you sir.

The [DPN notes](#) were very comprehensive and useful. I used it to supplement my newspaper knowledge. It really helped in dealing with the current affairs portion of the prelims exam, since you compile it from so many sources.

Would recommend students to maintain their own digital notes using that source.

After I didn't clear first prelims, I joined your [mains master notes](#) which helped me identify key areas for note making.

Thank you sir for your relentless effort in updating these notes.

They're helpful for the aspirants.



Ishita Kishore

AIR 1, CSE2022

Ishita has been a student of
ONE YEAR LAQSHYA PRELIMS MENTORSHIP
MAINS MASTER MENTORSHIP

CRACK

UPSC CSE 2025

BEST PERSONALIZED MENTORSHIP PROGRAM



UNION PUBLIC SERVICE COMMISSION
MARKSHEET

Civil Services (PRELIMINARY) Examination, 2016

Roll Number	0029983
Name	SANTOSH PANDEY
Marks Obtained	
Paper I	144.66
Paper II	107.50

REMARKS : QUALIFIED FOR CS(MAIN) EXAMINATION, 2016

Arjuna Prime 2025

- 1 Prelims Cum Mains Integrated Daily Plan
- 2 Entire GS Concept Sessions- Pre Cum Mains
- 3 Mains Master Notes GS 1 2 3 4 (Static)
- 4 LAQSHYA PRELIMS MENTORSHIP
- 5 Daily Current Affairs and Answer writing
- 6 Essay Guidance
- 7 Ethics by Ex Civil Servants
- 8 Interview mentorship by Ex- Civil Servants

ALL 6 PRELIMS QUALIFIED
4 MAINS QUALIFIED
STATE PCS QUALIFIED

*To be the best
Learn from the best*



AIR 1, CSE 2022

student of
ONE YEAR PRELIMS MENTORSHIP -LAQSHYA PROGRAM
MAINS MENTORSHIP -MAINS MASTER NOTES PROGRAM

JOIN NOW

Economy

SEBI asks small and mid-cap funds to disclose more about risks to investors

Section: Financial markets

Context:

- **India's market regulator has asked the country's asset managers** to give investors more information about the risks associated with their small and mid-cap funds, according to a fund manager and two people with knowledge of the matter.

More on news:

- **The Securities & Exchange Board of India (SEBI)** has also been reviewing stress tests conducted by such funds.
- **Small and mid-sized funds** have seen high inflows, causing concern among authorities about how they would hold up in the event of a sharp market selloff.
- Heavy inflows have sent the **Nifty small cap 250 index surging 71 per cent over the past 52 weeks and lifted the Nifty midcap 100 index 64 per cent.**
- That far exceeds the benchmark **Nifty's 28 per cent rise.**
- Mutual funds tend to keep between 1 percent and 5 percent of their assets as cash as a prudent measure to meet outflows, according to public documents.
- There is, however, **no minimum regulatory requirement.**

Definitions of various Caps:

- Small-cap stocks are defined as those with market caps of less than **50 billion rupees .**
- **Mid-cap stocks** are those with market values of between **50 billion and 200 billion rupees.**
- **Large-cap stocks** are usually well-established and dominant companies in their respective industries as their market capitalisation is **over Rs. 20,000 crores(200 Billion rupees).**
- The term **"cap" in large-cap refers to market capitalization.**

Newly Permitted Commodities for Derivatives Trading by MoF

Section: Financial Market

Recently, derivatives trading in 11 additional commodities, has been allowed by Finance Ministry, based on the recommendation from the Securities and Exchange Board of India (SEBI).

1. Skimmed Milk Powder
2. Cement
3. Apple
4. Bamboo
5. Timber
6. Weather
7. Freight
8. White Butter
9. Cashew
10. Metal Alloys
11. Manganese

Key Points:

- **Date of Notification:** The Finance Ministry issued the notification on March 1.
- **Legislation:** These commodities have been added under the Securities Contracts (Regulation) Act, 1956.
- **Total Number of Commodities for Derivatives Trading:** With these additions, the total number of commodities eligible for derivatives trading now stands at 104.
- **Immediate Effect:** The changes are implemented immediately upon the issuance of the notification.

Comments from Industry Experts:

- **Recommendation by CDAC:** The Commodity and Derivatives Advisory Committee (CDAC) of SEBI recommended trading in these 11 commodities. CDAC includes members of the Commodity Participants Association of India (CPAI).
- **Enabling Provision:** While the notification enables trading in these commodities, it does not mean immediate trading will commence. Exchanges will study market potential and submit applications to SEBI. SEBI will then assess demand and market prospects before allowing trading.
- **Market Participants' Involvement:** Market participant associations need to be on board before a commodity is approved for trading. Some physical market participants have reservations about online derivatives trading, citing concerns about price manipulation.
- **Ban on Some Commodities:** Derivatives trading in seven key agricultural commodities remains banned until December-end to control inflation.

Expert Opinion:

- **Price Discovery:** Allowing derivatives in these commodities will aid in price discovery for widely traded items.
- **Inflation Concerns:** There are concerns about the impact on inflation, with experts noting that the government is cautious about derivatives trading's role in price inflation.
- **Policy Certainty:** Hedgers and investors are seeking clarity and policy certainty regarding derivatives trading in agriculture commodities.

In summary, the recent move to permit derivatives trading in these 11 commodities aims to enhance market activity, aid in price discovery, and offer new opportunities for investors.

However, considerations about inflation, market demand, and policy certainty remain important factors in the process.

Exploring Derivatives: A Financial Instrument Overview

Derivatives are financial instruments that derive their value from an underlying asset, index, or interest rate. They serve as contracts whose value is linked to the performance of the underlying entity.

Types of Derivatives:

1. Forwards and Futures:
 - Description:

- Contracts that **obligate the buyer to purchase an asset at a predetermined price** on a specified future date.
- Both forwards and futures serve the same purpose, **with slight differences in their nature.**
- **Key Points:**
 - Buyers **commit to buy the asset at the agreed-upon price**, irrespective of the market price at maturity.
 - Commonly used in **commodities, currencies, and financial markets.**
- 2. **Options:**
 - **Description:**
 - Offer the **buyer the right, but not the obligation, to buy (call option) or sell (put option) the underlying asset at a specified price.**
 - The **buyer can exercise the option on the maturity date** or at any time before the maturity.
 - **Key Points:**
 - Provides flexibility to investors based on market movements.
 - Two types: Call options (for buying) and Put options (for selling).
- 3. **Swaps:**
 - **Description:**
 - Contracts facilitating the **exchange of cash flows between two parties.**
 - Involves swapping fixed cash flows for floating cash flows based on a specified underlying asset.
 - **Common Types:**
 - **Interest Rate Swaps:**
 - Exchange **fixed interest payments for variable (floating) interest payments.**
 - **Commodity Swaps:**
 - Exchange cash flows based on commodity prices (e.g., oil, gold).
 - **Currency Swaps:**
 - Exchange cash flows in different currencies, often used to hedge against currency risk.

Benefits and Applications:

- **Risk Management:**
 - Derivatives **enable hedging against adverse price movements**, reducing financial risk.
 - Investors use derivatives to protect their portfolios from market volatility.
- **Speculation:**
 - Traders utilize **derivatives to speculate on price movements without owning the underlying asset.**
 - Offers potential for higher returns but involves higher risk.
- **Enhanced Portfolio Diversification:**
 - Derivatives provide **exposure to diverse asset classes** without directly owning them.
 - Allows investors to spread risk across different markets and instruments.
- **Price Discovery:**
 - Derivative markets **contribute to price discovery by reflecting market sentiments and expectations.**
 - Prices of derivatives can indicate future market trends and sentiments.

Considerations and Risks:

- **Leverage:**
 - Derivatives often **involve leveraging, amplifying potential gains or losses.**
 - Requires careful risk management and understanding of exposure.
- **Counterparty Risk:**
 - Swaps and other derivative contracts involve counterparty risk.
 - Parties **must assess the creditworthiness of their counterparties** to mitigate default risks.
- **Market Volatility:**
 - Derivative prices can be **highly sensitive to market fluctuations.**

- Requires active monitoring and adjustment of positions.

National Commodities and Derivatives Exchange (NCDEX)

The National Commodities and Derivatives Exchange (NCDEX) is an **online commodities exchange based in India, specializing in agricultural commodities. Established in 2003**, NCDEX plays a crucial role in **facilitating trading, price discovery, and risk management in the agricultural sector.**

Key Highlights:

1. Establishment and Legal Structure:

- Founded on: April 23, 2003.
- Legal Status: NCDEX is a **public limited company incorporated** under the Companies Act, 1956.

2. Founding Institutions:

- NCDEX was established by a **consortium of prominent financial institutions** in India.
- Leading Founders:
 - **ICICI Bank Limited:** One of India's largest private sector banks.
 - **National Stock Exchange of India (NSE):** Premier stock exchange in India.
 - **National Bank for Agriculture and Rural Development (NABARD):** Financial institution focused on rural and agricultural development.
 - **Other Institutions:** Several other financial entities and institutions also participated in the founding of NCDEX.

3. Nature of Operations:

- NCDEX primarily **deals in agricultural commodities, offering a platform for trading, hedging, and price discovery.**
- The exchange provides a **transparent and efficient marketplace for farmers, traders, and other stakeholders** in the agricultural value chain.

4. Contracts Offered:

- NCDEX offers a range of futures contracts for various agricultural products.
- Currently, the **exchange lists around 25 contracts for different agricultural commodities.**
- These contracts **allow market participants to hedge against price risks, speculate on price movements, and participate in the agricultural market.**

5. Role in Agricultural Sector:

- The exchange plays a vital role in the agricultural sector by providing farmers with a platform to sell their produce at transparent prices.
- It enables farmers to **hedge against price fluctuations, reducing the impact of market uncertainties on their incomes.**
- Traders, processors, and other **stakeholders benefit from efficient price discovery and risk management tools offered by NCDEX.**

About Commodity Derivatives Advisory Committee (CDAC)

- **Mandate:** The Commodity Derivatives Advisory Committee (CDAC) is a **committee constituted by the Securities and Exchange Board of India (SEBI) to review the commodity derivatives segment.**

Objectives:

- 1. Improving Market Depth:** CDAC aims to **suggest measures to enhance the depth and efficiency of the commodity market in India.**

- 2. Recommendations:**

- **Opening to Institutional Investors:** CDAC has recommended the phased opening of the commodity derivatives segment to all categories of institutional investors.
- **Calibrated Approach for Overseas Investors:** SEBI is advised to adopt a careful and phased approach before allowing overseas investors into the commodity derivatives market.
- **Phased Approach:**
 - Initially, the **recommendation is to open the segment to all categories of domestic institutional investors.**
 - In the subsequent phase, **foreign portfolio investors (FPIs), banks, insurance companies, and pension funds should be allowed to participate.**

- **Asset Class Diversification:** CDAC highlights that commodity derivatives offer a new asset class for investors, which can serve as a hedge against inflation.
- **Portfolio Diversification:** Investment in commodity derivatives can benefit investors by providing better portfolio diversification, reducing overall risk exposure.

Significance:

- **Enhancing Liquidity:** Opening the commodity derivatives segment to institutional investors is expected to increase liquidity and depth in the market.
- **Risk Management:** Institutional participation allows for better risk management as investors can use commodity derivatives to hedge against price fluctuations.
- **Investor Benefits:** Institutional investors, including foreign entities, gain access to a new avenue for investment diversification, potentially improving overall portfolio performance.
- **Market Development:** These recommendations signify a step towards the development of a more robust and mature commodity derivatives market in India.
- **Regulatory Oversight:** SEBI's role in overseeing the phased opening ensures a structured approach to market expansion, safeguarding investor interests and market integrity.

The recommendations of the Commodity Derivatives Advisory Committee (CDAC) reflect a strategic approach towards strengthening the commodity derivatives market in India, fostering investor confidence, and promoting market development in line with regulatory standards.

Inclusion of Indian bonds in the Bloomberg Emerging Market (EM) Local Currency Government Index

Section: Financial Markets

The inclusion of Indian bonds in the Bloomberg Emerging Market (EM) Local Currency Government Index and related indices represents a significant development in India's presence in global financial markets.

Background:

- Bloomberg has announced the inclusion of Indian Fully Accessible Route (FAR) bonds in its Bloomberg EM indices.
- This move follows a similar announcement by JP Morgan Chase & Co last year, which included Indian government bonds in the JP Morgan GBI-EM Global index.

Phased Inclusion:

- The inclusion of Indian FAR bonds in the Bloomberg EM indices will occur in a phased manner over a ten-month period.
- It will begin on January 31, 2025, with an initial weight of 10% of their full market value.
- The weight of FAR bonds will then increase by increments of 10% every month until October 2025, when they will be weighted at their full market value in the indices.

Impact and Significance:

- The inclusion of Indian bonds in these indices reflects India's growing importance in the global economy.
- India is expected to become the third-largest country, after China and South Korea, in the market cap weighted version of the Bloomberg EM 10% Country Capped Index.
- Using data as of January 31, 2024, the index would include 34 Indian securities, representing 7.26% of a \$6.18 trillion index on a market value-weighted basis.

Benefits:

- Inclusion in global indices is expected to attract significant investments into India.
- It will bring dollar inflows into the country, helping to stabilize the financing of India's current account gap.
- Analysts estimate that the inclusion could attract investments exceeding \$5 billion, in addition to the expected investment of around \$20 billion from the JP Morgan EM Bond Fund.

Future Plans:

- Bloomberg indices will create an ex-India version of the EM Local Currency Government Index.
- They can also create other standard and custom versions of the index, providing more investment options for investors interested in emerging market bonds.

Overall Impact:

- The inclusion of Indian bonds in global indices **not only boosts India's visibility in international financial markets but also opens up new avenues for investment** in the country's debt market.
- It **signifies confidence in India's economic growth trajectory and policy reforms**, making it an attractive destination for global investors.

In conclusion, the phased inclusion of Indian bonds in the Bloomberg EM indices is a significant step that is expected to have **positive implications for India's financial markets, economy, and attractiveness to foreign investors.**

About Emerging Markets Bond Index (GBI-EM):

It is a **benchmark index** for measuring the **total return performance of international government and corporate bonds issued by emerging market countries.** Emerging market bonds are debt instruments issued by developing countries, offering higher yields compared to bonds of developed nations.

Inclusion of India's Local Bonds:

India's local bonds will be **included** in the **Government Bond Index-Emerging Markets (GBI-EM)** of JP Morgan. **Expected to reach the maximum weight of 10%** in the **GBI-EM Global Diversified Index (GBI-EM GD).**

23 Indian Government Bonds (IGBs) with a combined notional value of **\$330 billion** are **eligible** for inclusion.

All bonds are classified as **"fully accessible"** for **non-residents.**

Advantages of Inclusion:

- **Increased demand** for the **Indian rupee**, potentially **buffering** against **depreciation.**
- **Lower borrowing costs** can **fuel essential infrastructure projects.**
- **Enhanced liquidity** may **foster more efficient trading conditions.**
- **Market Development and Innovation**
- **Par with Other Countries** - India reaches 10% weightage in GBI-EM Global Diversified, aligning with countries like China, Brazil, Indonesia, and Malaysia.

Fully Accessible Route (FAR):

Brief:

- RBI has introduced the **Fully Accessible Route (FAR)** to **enable non-residents to invest in specified government bonds.**

Key Features:

- Eligible investors can **invest in specified government securities under FAR** without any investment ceilings.
- Operates alongside the existing routes, **namely the Medium Term Framework (MTF) and the Voluntary Retention Route (VRR).**

Benefits:

- Substantially eases access for non-residents to Indian government securities markets.
- Facilitates inclusion in global bond indices, **enhancing the visibility of Indian bonds in international markets.**
- **Encourages stable foreign investment inflows into government bonds,** promoting financial stability.

Voluntary Retention Route (VRR):

Brief:

- RBI introduced the **Voluntary Retention Route (VRR)** to **encourage Foreign Portfolio Investors (FPIs) for long-term investments** in Indian debt markets.

Key Features:

- Aggregate investment limit: **₹ 40,000 crores for VRR-Govt and ₹ 35,000 crores for VRR-Corp.**
- Minimum retention period of three years, **during which FPIs must maintain a minimum of 75% of the allocated amount in India.**
- Greater operational flexibility in terms of instrument choices and exemptions from certain regulatory requirements for FPIs.

SEBI relaxes FPI disclosure norms

Section: Capital market and money market

Exemption for Foreign Portfolio Investors (FPIs):

- Sebi has exempted **certain Foreign Portfolio Investors (FPIs) from the additional disclosure framework.**

- This relief applies to **FPIs that have more than 50% of their Indian assets under management (AUM) within a single corporate group.**
- The exemption is provided for **FPIs with concentrated holdings in a listed company** with no identified promoter, subject to certain conditions.

Relaxation of Timelines for Disclosure:

- Sebi has approved a **proposal to relax the timelines for the disclosure of material changes by FPIs.**
- Currently, FPIs are required to **disclose material changes within seven working days.**
- The new provision allows a minimum period of 180 days or the end of the registration block, whichever is later, **for the disposal of securities in case of adverse changes in compliance status or non-submission of documents for reclassification.**

Disposal of Securities:

- If securities held by an FPI are not disposed of after the specified 180-day period, an additional 180 days will be provided.
- However, **a financial disincentive of 5% of the sale proceeds will be credited by the custodian to Sebi's Investor Protection and Education Fund.**
- Securities remaining unsold after the additional period will **be deemed to have been compulsorily written off by the FPI.**

Launch of Beta Version of T+0 Settlement:

- Sebi has approved the **launch of a beta version of the optional T+0 settlement for a limited set of 25 scrips and with a limited set of brokers.**

Changes in Public/Rights Issue of Equity Shares:

- Sebi has decided to **eliminate the requirement of a 1% security deposit in public/rights issues of equity shares.**
- Additionally, flexibility will be provided to extend the offer closing date due to force majeure events.

Foreign Portfolio Investors (FPIs): An Overview

Foreign Portfolio Investment (FPI) refers to **investments made by foreign entities in financial assets such as stocks, bonds, mutual funds, and other securities of a country's financial markets.**

Unlike Foreign Direct Investment (FDI), **FPI does not involve acquiring a substantial ownership stake or control in the invested entity.** Instead, it represents a passive investment approach to earn returns from capital appreciation and dividends.

Characteristics of FPI:

1. **Passive Ownership:** FPI involves **holding financial assets without seeking to actively control or influence the management of the invested companies.** Investors rely on the performance of the assets for their returns.
2. **Liquidity and Volatility:** FPI investments are **relatively liquid, meaning they can be easily bought or sold in the financial markets.** However, this liquidity also makes FPIs more susceptible to market volatility and changes in investor sentiment.
3. **Diversification:** FPI allows investors to **diversify their portfolios across different countries, industries, and asset classes.** This diversification helps spread risk and potentially improve returns.
4. **Financial Instruments:** FPIs can invest in a variety of financial instruments, including but not limited to:
 - **Stocks:** Ownership shares of publicly traded companies.
 - **Bonds:** Debt securities issued by governments or corporations.
 - **Mutual Funds:** Pooled investment funds managed by professionals, investing in a diversified portfolio of assets.
 - **Exchange-Traded Funds (ETFs):** Funds that are traded on stock exchanges and represent a basket of securities.
 - **American Depositary Receipts (ADRs) and Global Depositary Receipts (GDRs):** Certificates representing ownership of shares in foreign companies traded on stock exchanges outside their home country.

Role in the Economy:

- FPIs play a crucial role in **providing liquidity to financial markets, helping to facilitate price discovery and efficient allocation of capital.**
- They contribute to the overall depth and breadth of financial markets, **making them more attractive to domestic investors and businesses.**
- FPIs can bring in foreign currency, which can **contribute to a country's foreign exchange reserves and support the stability of its currency.**

"Hot Money" and Risk Considerations:

- FPIs are often termed as **"hot money" due to their tendency to move swiftly in and out of markets based on economic conditions, interest rates, geopolitical events, and other factors.**

- This rapid movement can lead to **increased market volatility and potential risks** for domestic markets, especially during times of economic uncertainty or market stress.

SEBI's FPI Disclosure Norms:

Additional Disclosures:

- **Criteria for Disclosure:** SEBI requires Foreign Portfolio Investors (FPIs) **holding more than 50% of their Indian equity Assets Under Management (AUM) in a single Indian corporate group or having over Rs 25,000 crore of equity AUM** in the Indian markets to provide additional details.
- **Purpose of Disclosure:** The aim is to **enhance transparency and oversight**, particularly for FPIs with concentrated holdings that could potentially impact the market.

Alignment with PN3 Concerns:

- **Press Note 3 (PN3) Context:** While PN3 does not directly apply to FPI investments, **SEBI is cautious about potential misuse of the FPI route.**
- **Importance of Additional Disclosures:** SEBI views obtaining detailed information from FPIs as crucial to address concerns of **market disruption, regulatory circumvention, and ensure the protection of Indian securities markets.**

SEBI's move to require additional disclosures from FPIs reflects a proactive approach to **enhance transparency, mitigate market risks, and align foreign portfolio investments** with regulatory objectives in India's securities markets.

Press Note 3 (2020)

Context:

- Press Note 3 (2020) was introduced by the Union government during the Covid-19 pandemic as an amendment to the Foreign Direct Investment (FDI) policy.

Objective:

- The primary aim was to address concerns **related to opportunistic takeovers and acquisitions of stressed Indian companies at potentially undervalued prices.**

Key Provisions:

1. Government Route Mandate:

- Entities from countries **sharing a land border with India or where the beneficial owner of an investment is situated or is a citizen of such countries were required to follow the Government Route** for investments.

2. Investment Routes:

- **Government Route:** This route involves **obtaining official approval from regulatory bodies for foreign investments.** It is typically used for sensitive sectors or investments of strategic importance.
- **Automatic Route:** Under this route, **investments can be made without prior approval**, particularly in sectors where foreign participation is encouraged, and the investment does not pose significant regulatory concerns.

3. Change in Beneficial Ownership:

- The Press Note also specified that any transfer of ownership, whether existing or future Foreign Direct Investment (FDI), directly or indirectly, resulting in the beneficial ownership falling within the purview of the amended policy, would require government approval.

4. Enforcement:

- Press Note 3 (2020) was enforced through the **Foreign Exchange Management (Non-Debt Instruments) Amendment Rules 2020.**

5. Current Status:

- As of January 2024, Press Note 3 (2020) remains enforceable, **indicating that the government's regulations regarding FDI from border-sharing countries are still in effect.**

Implications and Significance:

- **Safeguarding Indian Interests:** The introduction of Press Note 3 *aimed to protect Indian companies, particularly those in distress during the pandemic, from potentially unfavorable takeovers.*
- **Enhanced Regulatory Oversight:** By mandating the Government Route for investments from specific countries, the government sought to **ensure closer scrutiny and approval** for investments in critical sectors.
- **Preventing Undervalued Acquisitions:** The requirement for government approval in cases of change in beneficial ownership aimed to prevent acquisitions or transfers at prices considered undervalued or detrimental to Indian interests.

Investor Protection and Education Fund (IPEF)

The Investor Protection and Education Fund (IPEF) is a **fund established by the Securities and Exchange Board of India (SEBI) for the protection of the interests of investors in the Indian financial market**. It serves as a mechanism to safeguard the rights of investors and educate them about various aspects of investing.

Purpose of IPEF:

The primary objectives of the Investor Protection and Education Fund are as follows:

- **Investor Protection:** The fund aims to protect the interests of investors, **particularly small investors, in securities markets. It provides a mechanism for compensating investors who have suffered losses due to defaults or fraudulent activities** by companies or market intermediaries.
- **Education and Awareness:** Another key objective is to educate investors **about their rights and responsibilities**. The fund supports initiatives and programs that promote investor education, financial literacy, and awareness about market risks.

Sources of Funding:

The IPEF is funded through various sources, including:

- **Unclaimed Dividends:** One of the primary sources of funding for the IPEF is unclaimed dividends. When dividends declared by companies remain unclaimed by shareholders for a specified period, they are transferred to the IPEF.
- **Unclaimed Shares:** Similarly, shares that are unclaimed by investors for a certain period, such as in cases of demat accounts with no activity, are transferred to the IPEF.
- **Refunds from SEBI:** Any fines, penalties, or disgorgements collected by SEBI from market participants may also contribute to the IPEF.

Shrinking Board Sizes and Corporate Governance: Key Insights

Section: Financial market and money market

- **Trend in Board Size:**
 - In recent years, **corporate boards are facing scrutiny over governance issues**, leading to a trend of shrinking board sizes.
 - A new report by Excellence Enablers, backed by **former SEBI Chairman M Damodaran**, reveals the **evolution in board sizes**.
 - In FY18 and FY19, the **range of board members varied from 4 to 22**, but by FY23, the **maximum board size has reduced to 16**.
- **Committee Requirements:**
 - With the **mandatory establishment of five board committees**, it is crucial to have an adequate number of members for effective functioning.
 - The aim is to **ensure proper constitution of committees, avoiding scenarios where the same members serve on multiple committees**.
- **Definition of Good Governance:**
 - The essence of **good corporate governance lies in doing the right things, at the right time, and for the right reasons**.
 - Entities that proactively practice **good governance for stakeholder interests often influence the creation of laws and regulations**.
- **Companies Act, 2013:**
 - Section 149 (1) of the Companies Act, 2013, mandates a board of directors with specific minimum and maximum director requirements.
 - **Public companies must have a minimum of three directors, private companies require a minimum of two, and one-person companies need at least one director**.
 - The Act sets the **maximum limit for directors at fifteen, with additional provisions for independent directors in listed public companies**.
- **Optimal Board Composition:**
 - Effective boards often boast a **balanced mix of executive and non-executive directors**, providing diverse insights and experiences.
 - The report emphasizes the importance of this mix **for better decision-making and governance effectiveness**.
- **Concerns on Combined Roles:**

- The report raises concerns about **combining the roles of Chairman and MD/CEO, which may compromise corporate governance principles.**
- When both positions hold executive responsibilities, it could hinder the oversight and checks expected in good governance practices.
- **Non-Mandatory Separation:**
 - It is noted that the **separation of Chairperson and MD/CEO roles is not mandatory**, posing challenges for maintaining governance standards.
 - The report highlights the need for this separation to ensure adequate checks and balances within corporate structures.
- **Conclusion:**
 - As corporate governance continues to evolve, the **focus on board sizes, composition, and role separation remains crucial.**
 - The ongoing scrutiny underscores the **importance of aligning board structures with best practices to uphold transparency, accountability, and stakeholder interests.**
 - The report calls for a deeper examination of these governance aspects to drive sustainable and responsible corporate conduct.

Section 149 (1) of the Companies Act, 2013

- **Minimum Number of Directors:**
 - Every company incorporated under the Companies Act, 2013, is required to have a board of directors.
 - The section specifies the **minimum number of directors that different types of companies must have.**
- **Public Company:**
 - In the case of a **public company**, the minimum number of directors required is **three**.
- **Private Company:**
 - For a **private company**, the Act mandates a minimum of **two directors**.
- **One Person Company (OPC):**
 - In the case of an **OPC** (One Person Company), which is a unique type of company designed for single entrepreneurs, the requirement is for at least **one director**.
- **Maximum Number of Directors:**
 - The section also provides for the **maximum number of directors a company can have**, setting the limit at **fifteen directors**.
- **Requirement for Independent Directors:**
 - Additionally, the Act stipulates that *every listed public company must have at least one-third of the total number of directors as independent directors.*
 - This requirement ensures a level of **independent oversight and governance** in listed companies.

In summary, **Section 149 (1) of the Companies Act, 2013, establishes the foundation for the composition of boards of directors in Indian companies.**

It sets out the minimum and maximum numbers of directors based on the type of company, ensuring a structured and balanced governance framework. Additionally, **it emphasizes the inclusion of independent directors in listed companies to enhance transparency and accountability.**

Corporate Governance and Recent Controversy at NSE

Corporate Governance encompasses a comprehensive set of rules governing the affairs of a corporation. **A lapse in governance not only impacts investors but also stakeholders, the public, and the government.**

Corporate Governance as the system by which companies are directed and controlled. It involves a set of rules, practices, and processes governing a firm.

Balancing Stakeholder Interests: Corporate Governance ensures a balance between the interests of stakeholders such as shareholders, management, customers, financiers, and the community.

Ethical Business Conduct: It ensures that business operations are ethical, compliant with laws, regulations, and industry best practices.

Structure of Corporate Governance in India

- **Companies Act 2013:** Provides a formal structure with provisions for Independent Directors, Board Constitution, General and Board Meetings, Audit Committees, etc.

- **Other Legislations:** Acts like the Competition Act 2002, Foreign Exchange Management Act 1999, and Industries (Development and Regulation) Act 1951 impact corporate governance.
- **SEBI Guidelines:** Mandates adherence to best practices through various guidelines for investor protection.
- **ICAI Accounting Standards:** Accounting standards and mandatory financial disclosures are issued by the ICAI.
- **Listing Agreement:** Stock exchanges have listing agreements with detailed provisions on audits, disclosures, and annual statements.
- **ICSI Secretarial Standards:** Standards on board and general meetings issued by the ICSI also contribute to governance.

Committees for Improving Governance

- **Rahul Bajaj Committee (1995):** Developed the 'Desirable Corporate Governance' code.
- **Kumar Mangalam Birla Committee (2000):** Focused on investor protection and transparency.
- **Naresh Chandra Committee (2002):** Covered corporate audits and auditor-company relationships.
- **Narayana Murthy Committee (2003):** Reviewed and recommended improvements in corporate governance.
- **Uday Kotak Committee (2017):** Proposed measures to enhance governance, including gender diversity on boards.

Conclusion

Robust Corporate Governance is essential for **restoring trust, preventing scams, and ensuring investor protection**. India needs a concerted effort to enhance governance practices, making them **inclusive, efficient, consensus-oriented, and rule-based**. These steps are crucial for fostering a healthy corporate environment and attracting both domestic and foreign investments.

Uday Kotak Committee Recommendations on Corporate Governance

The Uday Kotak Committee, constituted by SEBI, focused on improving Corporate Governance practices. Its mandate included:

- **Independence of Independent Directors:** Enhancing the independence and active involvement of independent directors in the company's functioning.
- **Related Party Transactions:** Improving safeguards and disclosures concerning related party transactions.
- **Investor Participation:** Addressing issues faced by investors regarding voting and participation in general meetings.
- **Board Evaluation:** Enhancing the effectiveness of board evaluation practices.
- **Disclosure and Transparency:** Suggesting measures to improve disclosure and transparency practices.

Key Recommendations

- **Separation of Roles:**
 - **Chairman and MD Roles:** Listed firms should **separate the roles of Chairman and Managing Director**. Chairmanship should be limited to non-executive directors only.
- **Minimum Board Strength:**
 - **Board Size:** Increase minimum board size to 6 members.
 - **Gender Diversity:** At least one woman to be appointed as an independent director.
 - **Board Meetings:** Listed firms should conduct at least five board meetings annually (up from the current four).
 - **Discussion Topics:** The board should discuss succession planning and risk management at least once a year.
- **Independent Directors:**
 - **Proportion:** At least half of the board members should be independent directors in listed companies.
 - **Attendance:** All directors must attend at least half of the board meetings.
 - **Age Limit:** Public shareholders' approval required for non-executive directors above 75 years of age.
- **Shareholder Meetings and Disclosures:**
 - **Webcasting:** Top 100 firms by market capitalization should webcast shareholder meetings.
 - **Cash Flow Statements:** All listed firms should disclose cash flow statements every six months.
 - **Quarterly Earnings:** Mandatory disclosure of quarterly consolidated earnings by listed firms.
- **Credit Ratings:**
 - **Transparency:** Listed entities should provide an updated list of all credit ratings obtained in one accessible place for investors.
- **Minimum Remuneration:**
 - **Independent Directors:** Minimum remuneration of Rs 5 lakh per annum.

- **Board Meeting Fees:** Sitting fee of Rs 20,000-50,000 for each board meeting.
- **Approval:** Public shareholders' approval required for annual remuneration of executive directors from promoter families exceeding specified limits.
- **Risk Management and IT Committee:**
 - **Cyber Security:** Top 500 listed companies should have a risk management committee focused on cyber security.
 - **IT Committee:** Listed entities must constitute an IT committee focusing on digital and technological aspects.

These recommendations aim to strengthen governance, enhance transparency, and align practices with global standards, ultimately benefiting investors and ensuring sustainable corporate growth.

Impact of Election Schedule on Nifty and Bank Nifty Options

Section: Financial market

- **Historical Timing and Current Scenario:**
 - Previous election results of 2009, 2014 and 2019 were announced in May.
 - Election Commission announced a seven-phase schedule from April 19 to June 1, with counting on **June 4**.
- **Market Reaction and Option Prices:**
 - **Today**, sharp decline in option prices for Nifty50 and Bank Nifty May contracts across: Both call and put options (*in-the-money* and *out-of-the-money*).
 - Many **traders unwinding positions built on expectations of May results, adjusting options**.
- **Analyst Insights and Market Strategies:**
 - Traders had created **short strangles at 21000 and 24000 strikes for both June and December expiries in 2024**.
 - Open interest buildup indicates **a preference for strategies during market uncertainty**.
 - Recent **sideways movement** affecting premiums on both sides of options.
 - **India's Volatility Index (VIX) closed higher at 13.59 today, down from recent peak of 15**.
- **Conclusion:**
 - Swift adjustment in options market due to unexpected shift in election results date to June.
 - Traders using strategies **like strangle and straddle to navigate uncertain market conditions**.

India's Volatility Index (VIX):

India's Volatility Index, commonly known as VIX, is a **measure of market volatility**. It is also referred to as the "**fear index**" as it **gauges investor sentiment and market uncertainty**.

Calculation:

VIX is calculated based on the prices of Nifty 50 Index options. It measures the **expected volatility in the Nifty 50 Index over the next 30 days**.

Interpretation:

- Higher VIX values indicate higher expected volatility and uncertainty in the market.
- Lower VIX values suggest lower expected volatility and a more stable market.

Usage:

- Investors and traders use VIX to assess market risk.
- It helps in making decisions on portfolio allocation and hedging strategies.

Straddle:

A straddle is an options strategy **where an investor buys an equal number of call and put options with the same expiration date and the same strike price**.

Objective:

- The goal of a straddle is to **profit from a significant price movement in the underlying stock, regardless of the direction (up or down)**.

Usage:

- Used when the **investor anticipates a major price movement but is uncertain** about the direction.
- Provides protection against potential losses in either direction.

Risk:

- The risk for a straddle is limited to the total premium paid for both the call and put options.
- **Losses occur if the stock price remains relatively stable** without a significant move in either direction.

Strangle:

A strangle is an options strategy **where an investor buys an equal number of out-of-the-money call and put options with different strike prices but the same expiration date.**

Objective: The objective of a strangle is **also to profit from a significant price movement in the underlying stock, regardless of the direction.**

Usage: Used when the investor expects a substantial price movement but is uncertain about the direction. **Provides a wider profit range compared to a straddle due to the different strike prices.**

Risk: The risk for a strangle is **limited to the total premium paid for both the call and put options.** Losses occur **if the stock price remains within the range of the two strike prices at expiration.**

In brief:

- Both straddles and strangles allow investors to benefit from significant price movements in a stock, regardless of direction.
- **Straddles** are beneficial when the direction of the stock price movement is unclear, providing protection in either scenario.
- **Strangles** are useful when the investor anticipates a significant movement but is unsure about the direction, offering a wider profit potential.
- Investors should consider the risks involved, **including the total premium paid for the options, and understand the potential tax implications of options trading gains and losses.**
- **Strangle** involves out-of-the-money options, offering potentially higher profits with greater risk.
- **Straddle** involves at-the-money options, offering a balanced risk-reward profile.

About Nifty:

NIFTY is a market index introduced by the National Stock Exchange (NSE). **The name Nifty is a blend of "National Stock Exchange" and "Fifty," coined by NSE.**

Establishment:

- Introduced in 1996 under the name CNX Nifty.
- Renamed as Nifty 50 in 2015.

Benchmark Index:

- NIFTY 50 is the flagship and benchmark-based index of NSE.
- Represents the performance of the 50 largest and most actively traded stocks listed on the NSE.

Composition:

- Consists of 50 largest companies from various sectors.
- Represents diverse sectors of the Indian economy.

Market Indicator:

- Reflects stock market trends and economic conditions.
- Often used as a barometer of the Indian equity market.

Comparison:

- One of the two main stock market indices in India.
- The other is **SENSEX, a product of the Bombay Stock Exchange (BSE).**

Simplifying Claims Settlement: IEPFA's Initiative**Section: Capital and money market**

The Investor Education and Protection Fund Authority (IEPFA) has **launched an initiative to enhance the investor experience and streamline the claims settlement process.**

- **Purpose of Initiative:**
 - Aimed at **simplifying, expediting, and streamlining the claims settlement process.**
 - Intends to **reimagine the refund process under the Companies Act, 2013.**

- **Objective:**
 - Ensure a **seamless and efficient mechanism for claiming refunds** from the IEPF Authority.
 - **Enhance investor satisfaction and ease of access to refund**
- **Invitation for Comments:**
 - Stakeholders, **including investors and industry participants, invited to provide feedback.**
 - Comments sought on improving the claims settlement process.
- **Amendments aims at: -**
 - **Enhanced Efficiency:** Aim to create a more efficient and responsive system for investor refunds.
 - **Transparent Process:** IEPFA seeks to ensure transparency and ease of access to refund mechanisms.
 - **Stakeholder Engagement:** Investors and industry participants encouraged to contribute ideas for process improvement.

Investor Education and Protection Fund Authority (IEPFA)

The Investor Education and Protection Fund Authority (IEPFA) is a **regulatory body established in 2016 under the provisions of the Section 125 of Companies Act, 2013**. Entrusted with the **responsibility of administering the Investor Education Protection Fund (IEPF)**.

Functions:

- Administers the Investor Education Protection Fund (IEPF), which includes making refunds of shares, unclaimed dividends, and matured deposits/debentures to investors.
- Promotes investor awareness and education through various initiatives.

Nodal Ministry:

- Operates under the **Ministry of Corporate Affairs, Government of India.**

Key Facts about the Investor Education Protection Fund (IEPF)

- **Establishment:**
 - Established under **the provisions of Companies Act, 2013.**
- **Crediting of Amounts:**
 - The following amounts **remaining unpaid and unclaimed for seven years are credited to the IEPF:**
 - Amounts in **unpaid dividend accounts** of companies.
 - **Application money received by companies for allotment of securities and due for refund.**
 - **Matured deposits and debentures** with companies.
 - **Grants and Donations:**
 - Receives grants and donations from the Central Government, State Governments, companies, or other institutions for the Fund's purposes.
 - **Investments:**
 - The Fund invests the amounts received, and **the interest or other income earned from these investments contributes to the Fund.**

The IEPFA plays a **vital role in safeguarding the interests of investors and promoting investor education and awareness**. It ensures that unclaimed funds are utilized for the benefit of investors and fosters transparency and accountability in the corporate sector.

Why did SEBI ask fund houses to stop ETF inflows?

Section: Capital Market

Context:

- **Markets regulator Securities and Exchange Board of India (SEBI)** has directed mutual fund houses to stop accepting any more inflows in schemes that invest in overseas exchange-traded funds (ETFs), starting April 1, 2024.

More on news:

- SEBI has issued these directions as inflows in these **overseas ETFs have come close to the mandated investment limit of \$1 billion in foreign ETFs.**
- The mutual fund industry has already reached 95 per cent or (\$ 950 million) of the \$1 billion limit. This is the reason why SEBI has asked mutual funds to temporarily stop accepting money in overseas ETFs

Why is SEBI's direction to MFs ?

- The **capital market regulator has asked asset management companies (AMCs)** not to accept funds in mutual fund plans that invest in **overseas exchange-traded funds (ETFs)** as the upper limit of \$1 billion for these investments is close to being breached.
- The regulator has asked to **stop fresh inflows in such schemes from April 1.**

What is the overall limit for mutual funds to invest in overseas ETFs?

- There is an overall cap of \$7 billion set by the **Reserve Bank of India (RBI)** for fund houses to invest in overseas stocks or mutual funds.
- MFs are also permitted to invest up to **\$1 billion in overseas exchange traded funds.**
- **Mutual fund industry** has been demanding the RBI to hike the overseas investment limit of \$7 billion.

What is an exchange traded fund?

- **An ETF, or exchange traded fund,** is a marketable security that tracks an index, a commodity, bonds, or a basket of assets like an index fund.
- Unlike **regular mutual funds, an ETF trades like a common stock** on a stock exchange.
- The traded price of an ETF changes throughout the day like any other stock, as it is bought and sold on the stock exchange.
- The trading value of an **ETF is based on the net asset value of the underlying stocks that an ETF represents.**
- ETFs typically have higher **daily liquidity and lower fees than mutual fund schemes, making them an attractive alternative for individual investors.**
- ETFs are considered to be more tax efficient compared to other mutual fund schemes.
- There are mainly **five types of ETFs – equity ETF, bonds ETF, commodity ETF, international ETF and sectoral/thematic ETF.**

Hong Kong lawmakers pass new national security law, giving government more power to curb dissent

Section: Capital Market

Context:

- **Hong Kong lawmakers passed a new national security law** on Tuesday that grants the government more power to quash dissent, widely seen as the latest step in a sweeping political crackdown that was triggered by pro-democracy protests in 2019.

More on news:

- The legislature passed the **Safeguarding National Security Law** during a special session on Tuesday.
- It comes on top of a **similar law imposed by Beijing four years ago**, which has already largely silenced opposition voices in the financial hub.
- **Hong Kong's Legislative Council**, which is packed with Beijing loyalists following an electoral overhaul, expedited the process.

About the law:

- The law threatens stringent penalties for a **wide range of actions authorities call threats to national security, with the most severe** — including treason and insurrection — punishable by life imprisonment.
- **Lesser offenses, including the possession of seditious publications,** could also lead to several years in jail.
- Some provisions allow **criminal prosecutions for acts committed anywhere in the world.**
- It is also known as **Article 23**

Market capitalisation

Section: Capital market

Context: The run-up in prices of small and mid-cap equities and the stress test the Securities and Exchange Board of India (SEBI) asked Mutual Funds to conduct on small and mid-cap funds.

What is market capitalisation?

Market capitalisation is the total value all shareholders have assigned to a firm listed on the stock exchange; it is computed by multiplying the market price of a share with outstanding shares

- As an illustration, the market price of MRF Ltd. is about ₹1,40,400, subject to daily fluctuations. This does not mean MRF is the most valuable stock in the country; it is the priciest
- MRF's market capitalisation stood at ₹46,200 crore in December 2023, which had risen in March, along with rise in stock price. The most valuable firm in the market viz. the one with the highest market cap is Reliance Industries.
- The market cap of Reliance was ₹16.4 lakh crore in December, which had risen in March, along with a rise in stock price. This shows the contrast between the firm with the highest market cap and the priciest stock. When the number of shares issued by the firm is relatively on the lower side, the value tends to get distributed, pushing up the stock price

Relevance of concept

- While there may be many parameters for categorising firms, market cap is popular. As the size of a business grows, the market assigns a higher value. That is referred to as large cap in the market. When the size of a business is small, only a limited number of stockholders are interested in it and the value is relatively lower. That is referred to as small-cap stock. In between, there are mid-cap stocks. Now the question is, what is the definition of large- or small-cap stocks. Equity analysts/fund managers have estimates and assume a number, beyond which the company is classified as a large-cap or mid-cap.
- For categorisation, there is a definition from SEBI that is applicable to mutual funds but can be taken as a proxy for the entire market. The definition counts the top 100 listed stocks, as per market cap, as large-cap stocks.
- The next 150 i.e. from stock number 101 to 250, are categorised as mid-cap. Beyond this, all stocks are classified as small-cap.
- To give you a perspective, the stock ranking number 100 (border line of large- and mid-cap) as on December 2023 had a market cap of ₹67,000 crore. The one ranking 250 (border line of mid- and small-cap) had a market cap of ₹22,000 crore.
- As per market terminology, there is another category viz. micro-cap. Firms that are small and vulnerable, which can be gauged from the relatively lower value assigned by the market, are referred to as micro. The implication is large-cap stocks are well discovered by market participants, the business is stable, upside scope i.e. market price moving up is there, but only so much, as the business is already tracked by a large section of the market.

Higher risk

- On the other hand, in small-cap stocks, the potential for the firm to grow and along with it, the stock price, is relatively higher. However, the risk is also higher as the firm is yet to gather critical mass and the vulnerability to business failure is relatively higher. Stock-market performance shows over a long period of time, small-cap funds offered by the Mutual Fund industry has delivered returns higher than large-cap funds. However, the volatility, as measured by the standard deviation of the returns, is higher in small-cap funds.
- The implication is you should have some allocation for small-cap stocks/funds in your portfolio.
- However, it should not be a major allocation of equity component of the portfolio. Over the last one year, small-cap stocks performed significantly better. While this is good for investors, volatility risk is even higher now at these levels

Scrutiny on De Minimis Trade Rule: Impact on Online Shopping and U.S. Economy

Section: External Sector

The **de minimis exception**, a trade rule **allowing duty-free entry of parcels under \$800 per person per day, is under intense scrutiny** as it shapes the landscape of online shopping and **raises concerns about its impact on American competitiveness, consumer safety, and trade practices** with non-market economies like China.

Impact of De Minimis Rule:

- **De Minimis Exception:** The de minimis exception allows parcels valued under \$800 to enter the U.S. duty-free per person per day. This rule **has enabled online retailers to offer extremely low prices, making it attractive to American consumers.**

Scrutiny and Concerns:

- **Lawmakers' Concerns:** Lawmakers are now questioning about the **rule facilitating the entry of products made by forced labor, illicit drugs, or unsafe materials** into the U.S.
- **Drug Trafficking Concerns:** A group of 40 lawmakers has raised concerns about the de minimis trade **facilitating the flow of deadly drugs like fentanyl into the U.S.**
- **Legislative Actions:** Lawmakers have introduced legislation to **exclude non-market economies like China from the de minimis rule. The proposed bills aim to make the practice reciprocal, aligning with the U.S.'s trade objectives.**

Defense of the De Minimis Rule:

- **Industry Defense:** The National Foreign Trade Council argues that **restricting its use would lead to increased costs for American consumers and small businesses.**

- **Impact on Consumers:** Critics of changes to the de minimis rule argue that **it could significantly increase the cost of online purchases for consumers.** For example, a \$50 package could double in price if the rule is amended.

Trade Figures and Growth:

- **Surge in De Minimis Packages:** The number of de minimis packages entering the U.S. has skyrocketed, **exceeding 1 billion in 2023, up from 134 million in 2015.**
- **China's Dominance:** China is the largest source of retail packages entering the U.S. under the de minimis rule, **accounting for the majority of the nearly 3 million small parcels entering daily.**
- **E-commerce Growth:** Cross-border e-commerce, including de minimis packages, has seen significant growth. **China's online sales expanded nearly 20% in 2023, reaching \$257 billion, with the U.S. being the biggest market.**

Potential Impact of Repeal:

- **Financial Impact:** A repeal or amendment of the **de minimis rule could add \$20 to \$30 to each transaction, making it financially challenging for businesses** to maintain their low prices.
- **Trade Dynamics:** Changes to the de minimis rule could have far-reaching implications **for the U.S. economy, international trade relations, and the competitiveness of American businesses in the global market.**

Conclusion:

The debate over the de minimis trade rule reflects broader concerns about trade practices, consumer affordability, and the role of online shopping in the modern economy.

As lawmakers and industry stakeholders navigate this issue, **the future of online retail, particularly in relation to non-market economies like China, remains uncertain.** The outcome of this scrutiny could reshape the landscape of cross-border e-commerce and consumer choices in the years to come.

About De Minimis rule

The **De Minimis rule, created in 1938,** refers to a **threshold below which certain goods or transactions are exempt from certain taxes, duties, regulations, or reporting requirements.**

The term "De Minimis" is Latin for "of minimal concern" or "trifling."

Origin and Purpose:

- The De Minimis concept was **initially introduced in the Tariff Act of 1930 in the United States.** It was designed to **simplify customs procedures and reduce administrative burdens on low-value imports.**
- The rule recognizes that the **cost and effort of collecting duties or enforcing regulations on very small transactions or goods may not be worthwhile** compared to the revenue or benefit gained.
- It aims to facilitate the flow of small-value shipments across borders **while allowing customs agencies to focus their resources on higher-value or riskier imports.**
- For example, in the context of international trade, **if the value of a shipment falls below the De Minimis threshold, it may not be subject to customs duties or import taxes.**

Evolution and Changes:

- Over time, the De Minimis threshold has been adjusted to reflect changing economic conditions, inflation, and trade practices.
- In the United States, the **De Minimis threshold for imports has increased over the years.** For instance:
 - The original De Minimis threshold in 1938 was set at \$5.
 - It was increased to \$200 in 1994.
 - In 2016, it was **further raised to \$800 per person per day for most goods imported into the U.S.**

Implications:

- **Benefits for Consumers:** Higher De Minimis thresholds can benefit consumers by allowing them to import low-cost goods without incurring additional duties or taxes.
- **Simplification of Customs Procedures:** It helps streamline customs procedures, particularly for express shipments and e-commerce transactions.
- **Promotion of Trade:** By reducing barriers to cross-border trade on low-value items, it encourages international commerce and access to global markets.
- **Challenges:** Critics argue that **excessively high De Minimis thresholds may disadvantage domestic producers by allowing cheap imports to flood the market.** It can also make it challenging to enforce regulations **related to product safety, intellectual property rights, and environmental standards.**

Conclusion:

The **De Minimis rule**, established in 1938 and subsequently adjusted, plays a significant role in international trade, customs procedures, and consumer access to global markets. While it offers benefits such as simplified customs procedures and lower costs for consumers, it also raises questions about **fair competition, revenue loss for governments, and regulatory enforcement**. The **threshold continues to be a subject of debate and consideration** as trade practices evolve in the modern global economy.

India-EFTA Free Trade Agreement

Section: External sector

- **Parties Involved:**
 - India and the four-nation European Free Trade Association (EFTA).
 - EFTA includes **Iceland, Liechtenstein, Norway and Switzerland**
- **Signing Date:** Expected to be signed on March 10, after long negotiations.
- **Aim of the Agreement:**
 - Increase **trade and investment flows between** India and EFTA countries.
 - **Foster job creation and economic growth** in both regions.
- **Expected Impact:**
 - The India-EFTA Trade and Economic Partnership Agreement (TEPA) is **anticipated to attract investments worth \$100 billion from the EFTA countries into India**. These investments are projected to occur over the next 15 years.
 - The **influx of investments is estimated to generate approximately one million jobs** in India.
- **Signatories:**
 - Government officials and industry representatives from all EFTA countries and India are informed about the signing.
- **First FTA with Investment Commitment:**
 - This agreement marks the **first Free Trade Agreement (FTA) where India secures commitments on investment and employment** from partner nations.
- **Trade Deficit Mitigation:**
 - The India-EFTA TEPA is expected to help **reduce the significant trade deficit that India currently has with the EFTA bloc**.

In summary, the India-EFTA Trade and Economic Partnership Agreement (TEPA) is set to be signed on March 10, aiming to **bolster trade, attract investments, create jobs, and address trade deficits between India and the European Free Trade Association (EFTA) countries of Switzerland, Finland, Norway, and Liechtenstein**.

This agreement is notable as it secures commitments on investment and employment, potentially bringing substantial economic benefits to both sides.

TEPA - Trade and Economic Partnership Agreement:

- A Trade and Economic Partnership Agreement (TEPA) is a **type of economic partnership agreement between countries**. It offers flexibility in **negotiating terms and conditions, tailored to the specific needs and interests of the involved parties**.

Objective of TEPA:

- Aims to boost bilateral trade and economic cooperation between India and EFTA.
- Goals include **reducing tariffs and non-tariff barriers, enhancing market access, and promoting investment flows**.

About EFTA - European Free Trade Association:

- **Establishment:** Founded in 1960.
- **Member Countries:** Iceland, Liechtenstein, Norway, and Switzerland.
- **Headquarters:** Geneva.
- **Purpose:** To **promote free trade and economic cooperation** among member states and with other countries.
- **Relationship with EU:** EFTA has a close relationship with the EU, **having signed several agreements facilitating the free movement of goods, services, capital, and people** between EFTA countries and the EU.
- **Strengths of EFTA Countries:**
 - These economies rank among the **highest globally in innovation, competitiveness, wealth creation per inhabitant, life expectancy, and quality of life**.

- EFTA companies are leaders in **pharmaceuticals, biotechnology, machinery manufacturing, R&D-driven technology products**, and more.

Trade with India:

- EFTA is **India's 9th largest trading partner**, accounting for 2.5% of India's total merchandise trade in 2020-21.
- Main Indian exports to EFTA: **textiles, chemicals, gems, jewelry, machinery, and pharmaceuticals**.
- Main Indian imports from EFTA: **machinery, chemicals, precious metals, and medical instruments**.

Potential Benefits of TEPA between India and EFTA States:

- **Trade:**
 - India's growth and leadership in **green technologies** could benefit from EFTA's support.
- **Market Access:**
 - Improved access for Indian goods to EFTA markets, where **EFTA export products often serve as inputs in Indian export industries**.
- **Investment:**
 - Expected increase in investment from EFTA states (already over USD 35 billion invested in India).
- **Mutual Benefits:**
 - EFTA states can benefit from **India's skilled workforce in the services sector**.
 - India can **benefit from the 400+ companies established by EFTA states, generating over 150,000 jobs**.
- **Renewable Technologies:**
 - EFTA states can **contribute cutting-edge technologies in solar, wind, hydro, and geothermal power to India's green growth aspirations**.

Challenges in Implementing TEPA between India and EFTA Countries:

- **Economic Structure:**
 - EFTA countries focus on high-tech industries, while **India's industries generally serve lower and middle-tech sectors**.
- **Market Access:**
 - Addressing issues related to **tariffs, quotas, and non-tariff barriers** for free and fair trade.
- **Regulatory Differences:**
 - **Variances in regulations, standards, and legal frameworks** between India and EFTA countries.
- **Securing Domestic Manufacturers:**
 - Particularly important in sectors where **EFTA countries have a competitive edge, such as pharmaceuticals and machinery manufacturing**.
- **Environmental and Social Considerations:**
 - Addressing challenges like **promoting sustainable development and gender equality**.

Conclusion:

For a successful TEPA between India and EFTA, **addressing outstanding issues, identifying areas of mutual benefit, and promoting collaboration on skilled labor are crucial**. Strong political involvement and guidance are necessary for a swift negotiation process.

EoUs and SEZs to get RoDTEP sops until September 30

Section: External sector

The announcement made by the Centre regarding the **Remission of Duties and Taxes on Exported Products (RoDTEP) Scheme** includes the **eligibility of outbound shipments from Special Economic Zones (SEZs) and Export Oriented Units (EOUs)** for tax refunds. **This move is significant as SEZs and EOUs collectively account for about a quarter of India's total exports**.

1. **Scope of Eligibility:**
 - Outbound shipments from SEZs and EOUs will now qualify for tax refunds under the RoDTEP Scheme.
 - This extends the benefit of the **RoDTEP Scheme to these entities, recognizing their substantial contribution to India's export landscape**.
2. **Advance Authorisation (AA) Scheme:**
 - Exporting firms utilizing the **Advance Authorisation (AA) scheme** will also be covered under the RoDTEP Scheme.

- The AA scheme **allows duty-free import of inputs that are physically incorporated into the exported products.**
 - By including AA scheme users, the **RoDTEP Scheme aims to incentivize and support exporters who rely on duty-free imports for their manufacturing processes.**
3. **Objective:**
- The RoDTEP Scheme is designed to **promote exports by refunding duties and taxes incurred on the export of goods.**
 - By providing tax refunds, the **scheme aims to make Indian exports more competitive in the global market and boost the country's overall export performance.**
4. **Commerce and Industry Minister's Statement:**
- Commerce and Industry Ministry announced the **extension of the RoDTEP Scheme to SEZs, EOUs, and AA scheme users.**
 - This move is part of the government's efforts to **support and promote the growth of India's export sector, particularly in key areas such as SEZs and EOUs.**
5. **Significance:**
- SEZs and EOUs play a crucial role in India's export ecosystem, offering various benefits and incentives to businesses operating within these zones.
 - By including these entities under the RoDTEP Scheme, **the government aims to further encourage exports from these zones, thereby driving economic growth and employment.**

About SEZs:

- An SEZ is a designated territory within a country that **operates under special economic regulations and incentives.**
- **Purpose:** SEZs are established to **encourage investment, boost exports, create employment opportunities, and enhance ease of doing business.**
- **Evolution in India:**
 - Asia's first Export Processing Zone (EPZ) was set up in Kandla, Gujarat in 1965.
 - India **shifted from EPZs to SEZs in 2000** to address infrastructural and bureaucratic challenges.
 - The **Special Economic Zones Act was enacted in 2005, with the rules coming into effect in 2006.**

Current Status of SEZs in India:

- **Number and Location:**
 - India presently has 378 notified SEZs, out of which 265 are operational, as on March 2021
 - The majority of SEZs, about 64%, are located in five states: **Tamil Nadu, Telangana, Karnataka, Andhra Pradesh, and Maharashtra.**
- **Apex Body:** The Board of Approval, headed by the Secretary of the Department of Commerce, oversees SEZs.
- **Baba Kalyani Committee:**
 - In 2018, the Ministry of Commerce and Industry formed the **Baba Kalyani-led committee to evaluate and suggest improvements to the SEZ policy.**
 - The committee aimed to **align the SEZ policy with global best practices** and make it WTO-compatible.

Major Incentives and Facilities:

- Duty-free import or domestic procurement of goods for SEZ units' development, operation, and maintenance.
- Exemption from various taxes such as Income Tax and minimum alternate tax.
- External commercial borrowing by SEZ units up to US \$500 million annually.
- Single window clearance for approvals at the Central and State levels.

Challenges Faced:

- **Underutilized Land:**
 - Lack of demand for SEZ space, exacerbated by disruptions caused by the pandemic.
- **Multiple Economic Zone Models:**
 - Challenges in integrating various models like SEZs, coastal economic zones, industrial corridors, etc.
- **Competition from ASEAN Countries:**
 - ASEAN countries' policies attracting global investments to their SEZs, leading to increased competition.

About Export Oriented Units (EoUs)

EOUs, or Export Oriented Units, are **industrial plants or facilities set up for the purpose of producing goods or services primarily for export**. These units are established under the Export Oriented Unit (EOU) Scheme which is governed by the **Directorate General of Foreign Trade (DGFT) in India**.

Purpose:

- **Export Focus:** EOUs are dedicated to **producing goods and services specifically for export markets**.
- **Boost Exports:** The main objective of EOUs is to **promote exports from India by providing certain incentives and facilities to manufacturers**.

Benefits and Incentives:

- **Duty-Free Imports:** EOUs can import raw materials, components, and capital goods without paying customs duties.
- **Tax Benefits:** Exemption from Central Excise duty on goods procured domestically for production.
- **Foreign Exchange:** EOUs can retain and utilize 100% of foreign exchange earnings.
- **Infrastructure Support:** Access to infrastructure facilities like customs clearance, banking, and security services.
- **Simplified Procedures:** Single-window clearance for various approvals and licenses.

Remission of Duties and Taxes on Exported Products (RoDTEP) Scheme:

The RoDTEP scheme, introduced to replace the Merchandise Export from India Scheme (MEIS), has been notified by the Government of India, outlining rates and norms to support exporters.

Objective: To refund embedded central, state, and local duties or taxes that were not previously rebated, addressing the non-compliance issues with the World Trade Organization (WTO) rules.

Key Features:

1. **Scope:**
 - Covers 8,555 tariff lines, constituting around 75% of traded items and 65% of India's exports.
 - Budgetary allocation of ₹12,454 crore for the fiscal year 2021-22.
2. **Zero Rating of Exports:**
 - Aims to achieve zero rating of exports by ensuring that domestic taxes are not exported.
3. **Refund Mechanism:**
 - Refunds encompass all taxes, including those levied by states and local bodies.
 - Refund rates, considered WTO-compliant, range from 0.5% to 4.3% of the Free On Board (FOB) value of outbound consignments.
4. **Rate Variation:**
 - Rates vary based on the product category. For example:
 - Lowest rates for items like chocolates, toffees, and sugar confectionery.
 - Highest rates for yarns and fibers.
 - Exclusion of certain sectors like steel, pharma, and chemicals.
5. **International Standards and Automatic Refunds:**
 - Enables Indian exporters to meet international standards for exports.
 - Provides affordable testing and certification within the country, reducing dependence on international organizations.
 - Facilitates automatic tax assessment and refunds for GST, streamlining the process for exporters.

The RoDTEP scheme aligns with India's efforts to facilitate a conducive environment for exporters, promoting economic growth and enhancing the country's position in the global market.

About Advance Authorization Scheme

The Advance Authorization Scheme, implemented by the Directorate General of Foreign Trade (DGFT) under the Foreign Trade Policy, is a **encouraging program for exporters in India**.

Overview:

The Advance Authorization Scheme **allows for the duty-free import of inputs that are necessary for the production of export goods**. These inputs can include raw materials, components, parts, packaging materials, fuel, oil, and catalysts that are **used or consumed in the manufacturing process of export products**.

Purpose:

The main objective of the scheme is to promote exports by **enabling exporters to import inputs without paying duty. This reduces the cost of production for export goods, making them more competitive in the global market.**

Benefits:

- **Simplified Process:**
- **Shorter Turnaround Times:**
- **Ease of Doing Business:**
- **Reduced Compliance Burden:**
- **Validity:** An Advance Authorization is **typically valid for 12 months** from the date of its issue. During this period, the authorized holder can import the specified quantity of duty-free inputs for use in the production of export goods.

Conclusion:

The Advance Authorization Scheme is a valuable tool for Indian exporters, offering them the opportunity to **import necessary inputs without incurring duty costs.** The **creation of a searchable norms database by the DGFT further enhances the scheme's efficiency, enabling exporters to benefit from shorter processing times, reduced compliance burdens, and improved competitiveness in international markets.** This trade facilitation measure aligns with the government's efforts to promote exports and boost the country's economic growth.

India's Proposal on Moratorium on Customs Duties for E-Transmissions

Section: External Sector

- **Background:**
 - The moratorium on customs duties for e-transmissions has been **receiving temporary extensions at the World Trade Organisation (WTO) since 1998.**
 - India aims to redefine the scope and definition of this moratorium, **particularly regarding digitized goods like e-books, e-music, and video games.**
- **Recent Developments:**
 - At the 13th WTO ministerial conference in Abu Dhabi, India agreed to a **two-year extension** of the moratorium.
 - However, **India indicated that further extensions may require a consensus on the scope, definition, and impact on development.**
 - The country wants discussions to continue at the **WTO general council** to reach an agreement before the current extension ends.
- **Need for Reexamination:**
 - India, along with **developing countries like South Africa, emphasizes the need to reexamine the moratorium.**
 - The global e-commerce sector has **evolved significantly since its introduction, with many physical goods now digitized.**
- **Scope of the Moratorium:**
 - India argues that the **moratorium should apply to the transmission of signals rather than the content itself.**
 - The goal is to clarify what exactly the **moratorium would cover to make an informed decision before the current extension expires in March 2026.**
- **Urgency of Discussion:**
 - The official emphasizes the need for serious discussions at the general council to avoid delays.
 - With the **digital revolution ongoing and technologies like additive manufacturing, data analytics, and AI expanding, the implications of the moratorium need re-evaluation.**
- **Balancing Concerns:**
 - While the extension of the e-transmission moratorium has been linked to the moratorium on **non-violation and situation complaints (NVSCs) under the TRIPS Agreement,** India stresses the greater benefits of clarifying the e-transmission moratorium.
 - The potential gains for **developing countries outweigh concerns about the lapse of the NVSC moratorium.**
- **Conclusion:**
 - India seeks a thorough discussion at the **WTO general council to define the moratorium's scope, considering the evolving digital landscape.**

- The country aims to ensure a balanced approach that **supports digital innovation while addressing concerns about customs duties on digitized goods.**

Non-Violation and Situation Complaints (NVSCs) under the TRIPS Agreement

- **Background:**
 - The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) is an international agreement administered by the World Trade Organization (WTO).
 - It sets **down minimum standards for many forms of intellectual property (IP) regulations.**
- **Non-Violation Complaints:**
 - NVSCs are a unique feature of the TRIPS Agreement.
 - They are **complaints brought to the WTO when a member believes that another member's actions have nullified or impaired benefits that it would have reasonably expected to accrue to it.**
 - These complaints can be filed even **if the actions of the accused member do not violate specific provisions of the TRIPS Agreement.**
- **Situation Complaints:**
 - Situation complaints are similar to non-violation complaints **but are related to situations where there is no violation of the specific rules of the agreement.**
 - Instead, **a member claims that another member's actions or policies have created a situation that nullifies or impairs benefits that would otherwise be accrued under the agreement.**

Key Aspects

1. **Legal Basis:**
 - NVSCs are based on the understanding that the **TRIPS Agreement should not just prevent violations but also address situations where the essence of the agreement is undermined.**
 - They are not about proving a violation of the TRIPS Agreement **but about addressing instances where the expected benefits of the agreement are nullified.**
2. **Scope of Complaints:**
 - NVSCs can cover a wide range of issues, **such as changes in domestic laws or practices that have an adverse impact on the expected benefits under the TRIPS Agreement.**
 - They allow members to challenge actions or situations that affect the essence of the agreement, even if those actions do not constitute a clear violation of specific provisions.
3. **Challenges:**
 - NVSCs have been subject to debate and controversy within the WTO.
 - Some members argue that they create uncertainty in the interpretation and application of the TRIPS Agreement.
 - Critics also point out that **NVSCs can potentially lead to trade disputes based on abstract legal concepts rather than clear violations of agreed-upon rules.**
4. **Examples:**
 - A member might file an NVSC **if another member introduces new IP laws that, while technically compliant with TRIPS, substantially diminish the market access or economic benefits expected under the agreement.**
 - Another example could be a complaint about a member's use of compulsory licensing, arguing that it undermines the expected value of patent protection.

Non-Violation and Situation Complaints under the TRIPS Agreement represent a nuanced aspect of international trade law, **aiming to uphold the principles of fair trade while ensuring that the expected benefits of intellectual property protections are realized.**

India's Pursuit for Lowering Cross-Border Remittance Costs

Section: External Sector

- **Proposal at WTO's Ministerial Conference:**
 - India proposed **lowering the cost of cross-border remittances at the WTO's 13th Ministerial Conference in Abu Dhabi.**
 - The proposal aims to **benefit low and middle-income countries, which accounted for 78% of remittances in 2023.**
- **Request to WTO's General Council (GC):**

- India has asked the WTO's General Council to **initiate a work programme for recommendations on lowering remittance costs.**
- The National Payments Corporation of India is preparing a presentation for a session on '**cost of remittances**' at the **WTO's committee on trade in financial services** in Geneva on March 25.
- **Highlighting the Need for Interoperability:**
 - India emphasized **promoting interoperability and interlinkages of digital payment infrastructures for cheaper, faster, and more transparent** cross-border payments.
 - Global average cost for sending digital remittances is significantly lower at 4.84% compared to non-digital remittances.
- **Support and Interest:**
 - India's proposal received support from countries like Sri Lanka, Nepal, and Bangladesh at WTO MC13.
 - The European Union (EU) also showed interest in the proposal.
- **Next Steps:**
 - Pursuing the matter at the WTO in various bodies, including the WTO General Council.
 - Proposal for the WTO GC to call upon **the council for trade in services and committee on trade in financial services for a work programme on remittances.**
- **Objectives of the Work Programme:**
 - Understanding the development impact of cross-border remittances.
 - Reviewing the cost, trends, and developments in remittance services.
 - Analyzing the **impact of technology, new market players, providers, channels, and consumer behavior.**

India's efforts aim to make cross-border remittances **more efficient, affordable, and accessible, benefiting a large segment of the global population.**

India's Proposal on Remittance Costs:

- India proposed to reduce the **cost of cross-border remittances** to less than **3%**, aligning with the **UN Sustainable Development Goals.**
- The initiative received **support** from several **World Trade Organization (WTO)** members, except the **US.**

Expected Benefits:

- Lowering remittance costs could potentially **boost inflows** of remittances into India.
- It aims to **reduce reliance** on informal channels for remittance transfers.

Implications for Businesses:

- The initiative could be particularly advantageous for **Indian businesses**, especially those utilizing the **Unified Payments Interface (UPI).**
- It opens avenues for **global expansion** and **increased competitiveness** in the export market.

Remittance Statistics:

- In 2023, India received a substantial **\$125 billion** in remittances.
- The associated costs of these remittances were estimated to be **\$7-8 billion.**

Beneficiaries:

- Lowering remittance costs would directly benefit the **Indian diaspora**, especially migrant workers abroad.
- It would also support **Micro, Small, and Medium Enterprises (MSMEs)**, potentially aiding their growth and competitiveness.

Understanding the Cost of Remittances:

- **Remittances** are financial transfers sent by migrant workers to their families or relatives in their home countries.
- The **cost of remittances** refers to the **expenses incurred in sending money across international borders.**

Components of Cost:

- These costs can include various elements such as:
 - **Bank fees,**
 - **Intermediary fees,**
 - **Compliance fees,**

- **Operational costs**, and
- **FX (foreign exchange) rate margin**.

Technological Innovations:

- Innovative technologies are emerging to **reduce the total cost of cross-border transactions**.
- These advancements **aim to streamline processes, reduce fees, and provide more efficient and cost-effective remittance options**.

India's Pursuit for Lowering Cross-Border Remittance Costs

Section: External Sector

- **Proposal at WTO's Ministerial Conference:**
 - India proposed **lowering the cost of cross-border remittances at the WTO's 13th Ministerial Conference in Abu Dhabi**.
 - The proposal aims to **benefit low and middle-income countries, which accounted for 78% of remittances in 2023**.
- **Request to WTO's General Council (GC):**
 - India has asked the WTO's General Council to **initiate a work programme for recommendations on lowering remittance costs**.
 - The National Payments Corporation of India is preparing a presentation for a session on **'cost of remittances' at the WTO's committee on trade in financial services** in Geneva on March 25.
- **Highlighting the Need for Interoperability:**
 - India emphasized **promoting interoperability and interlinkages of digital payment infrastructures for cheaper, faster, and more transparent** cross-border payments.
 - Global average cost for sending digital remittances is significantly lower at 4.84% compared to non-digital remittances.
- **Support and Interest:**
 - India's proposal received support from countries like Sri Lanka, Nepal, and Bangladesh at WTO MC13.
 - The European Union (EU) also showed interest in the proposal.
- **Next Steps:**
 - Pursuing the matter at the WTO in various bodies, including the WTO General Council.
 - Proposal for the WTO GC to call upon **the council for trade in services and committee on trade in financial services for a work programme on remittances**.
- **Objectives of the Work Programme:**
 - Understanding the development impact of cross-border remittances.
 - Reviewing the cost, trends, and developments in remittance services.
 - Analyzing the **impact of technology, new market players, providers, channels, and consumer behavior**.

India's efforts aim to make cross-border remittances **more efficient, affordable, and accessible, benefiting a large segment of the global population**.

India's Proposal on Remittance Costs:

- India proposed to reduce the **cost of cross-border remittances** to less than **3%**, aligning with the **UN Sustainable Development Goals**.
- The initiative received **support** from several **World Trade Organization (WTO)** members, except the **US**.

Expected Benefits:

- Lowering remittance costs could potentially **boost inflows** of remittances into India.
- It aims to **reduce reliance** on informal channels for remittance transfers.

Implications for Businesses:

- The initiative could be particularly advantageous for **Indian businesses**, especially those utilizing the **Unified Payments Interface (UPI)**.
- It opens avenues for **global expansion** and **increased competitiveness** in the export market.

Remittance Statistics:

- In 2023, India received a substantial **\$125 billion** in remittances.
- The associated costs of these remittances were estimated to be **\$7-8 billion**.

Beneficiaries:

- Lowering remittance costs would directly benefit the **Indian diaspora**, especially migrant workers abroad.
- It would also support **Micro, Small, and Medium Enterprises (MSMEs)**, potentially aiding their growth and competitiveness.

Understanding the Cost of Remittances:

- **Remittances** are financial transfers sent by migrant workers to their families or relatives in their home countries.
- The **cost of remittances** refers to the **expenses incurred in sending money across international borders**.

Components of Cost:

- These costs can include various elements such as:
 - **Bank fees,**
 - **Intermediary fees,**
 - **Compliance fees,**
 - **Operational costs,** and
 - **FX (foreign exchange) rate margin.**

Technological Innovations:

- Innovative technologies are emerging to **reduce the total cost of cross-border transactions**.
- These advancements **aim to streamline processes, reduce fees, and provide more efficient and cost-effective remittance options**.

Mauritius: Shifting Perspectives on Taxation and Investment

Section: Fiscal Policy

From Tax Haven to Gateway

- **Reform Initiatives:**
 - Mauritius, historically seen as a tax haven, has undertaken substantial reforms.
 - Initiatives such as **signing the Multilateral Instrument, abolishing the deemed foreign tax credit, and amending the Income Tax Act** have reshaped its financial landscape.
- **Eliminating Tax Haven Image:**
 - Mauritius no longer fits the tax haven mold.
 - **Stricter regulations and transparency measures** have been put in place to dispel this perception.
- **Gateway for Indian Investors:**
 - Mauritius aims to position itself as a **gateway for Indian companies venturing into African markets**.
 - Trade agreements **with 34 out of 54 African nations** offer a secure investment environment for funds flowing into Africa via Mauritius.

Recent Developments and Assurance

- **India Business Mission:**
 - India Business Mission **included visits to key cities, highlighting the investment potential in Mauritius**.
- **Transparency and Compliance:**
 - Mauritius asserts its compliance with **international standards on Anti-Money Laundering and Counter Terrorism Financing**.
 - The absence of shell companies and a robust regulatory framework support this claim.
- **International Recognition:**
 - The Mauritius International Financial Centre (MIFC) has received **positive assessments from international bodies like the IMF, World Bank, and OECD**.
 - Compliance with OECD guidelines affirms **Mauritius' adherence to international tax regulations**.

Financial Sector Assurance

- **Legislative Amendments:**

- Recent legislative changes include the **abolition of Global Business category 2 companies.**
- The deemed **foreign tax credit regime has been entirely removed**, aligning with global financial standards.
- **Fiscal Regime Evaluation:**
 - The Organisation for Economic Co-operation and Development (OECD) conditions for defining tax havens do not apply to Mauritius.
 - The **country demonstrates compliance and transparency in its fiscal practices.**
- **MIFC: A Global Hub:**
 - The MIFC, under the **Economic Development Board Mauritius, serves as a hub for international banks, legal firms, and investment entities.**
 - It provides a conducive environment for global financial operations.

Investment Strategy for Africa

1. **Risk Mitigation:**
 - Indian investors to **utilize Mauritius as a strategic base for African operations.**
 - Direct investments in African nations may pose risks due to legal uncertainties.
2. **Safety Through Agreements:**
 - Routing investments through Mauritius **ensures safety, backed by trade agreements with multiple African countries.**
 - This strategy offers protection against potential changes in local laws and safeguards investments.
3. **Success Stories:**
 - Companies like **Huawei have leveraged Mauritius as a starting point for African market entry.**
 - The approach has **resulted in sustainable growth and minimized risks** for businesses operating in the region.

In summary, **Mauritius' transformation from a perceived tax haven to a trusted financial gateway presents significant opportunities for Indian investors eyeing the African market.** The country's commitment to transparency, compliance, and strategic partnerships ensures a secure and favorable environment for international investments. Through Mauritius, **Indian companies can access diverse African markets while mitigating potential risks and maximizing growth potential.**

Tax Haven:

A tax haven refers to a **country or jurisdiction that offers foreign businesses and individuals minimal or no tax liability.** It provides a **politically and economically stable environment with favorable tax laws, secrecy, and confidentiality.**

Characteristics:

- **Low or No Taxation:** Tax havens often impose minimal or no taxes on income, capital gains, inheritance, or corporate profits.
- **Secrecy:** They offer confidentiality and limited disclosure of financial information, protecting the identity of investors.
- **Stable Environment:** Political and economic stability is crucial to attract foreign investments seeking safe harbors.

Purpose:

- Businesses and individuals use tax havens to legally reduce their tax obligations.
- They facilitate tax planning, asset protection, and wealth management strategies.

Anti-Money Laundering (AML):

AML refers to a **set of laws, regulations, and procedures designed to prevent the illegal generation of income through criminal activities.** It aims to **detect and deter the process of making illegal funds appear legitimate ("money laundering").**

Objectives:

- **Detection:** Identify and monitor financial transactions to detect suspicious activities.
- **Prevention:** Implement measures to prevent criminals from using financial systems to launder money.
- **Compliance:** Ensure financial institutions adhere to AML laws by implementing robust internal controls.

Key Components:

- **Customer Due Diligence (CDD):** Verify the identity of customers and assess the risks associated with their transactions.
- **Transaction Monitoring:** Monitor transactions for unusual patterns or activities that may indicate money laundering.
- **Reporting Requirements:** Oblige financial institutions to report suspicious transactions to regulatory authorities.

Counter Terrorism Financing (CFT):

CFT focuses on **preventing terrorist organizations from raising, moving, and using funds for illicit activities.**

It complements AML efforts by targeting financial resources that support terrorism.

Objectives:

- **Disruption:** Disrupt the financial networks and funding sources of terrorist organizations.
- **Prevention:** Implement measures to prevent the use of legitimate financial systems for terrorist financing.
- **Intelligence Sharing:** Enhance cooperation between financial institutions, law enforcement, and intelligence agencies.

In summary, tax havens offer favorable tax environments, while AML/CFT frameworks aim to safeguard the financial system from illicit activities.

Compliance with AML/CFT regulations is essential to maintain financial integrity and prevent misuse of financial systems for criminal purposes.

Money Laundering: Overview and Methods

Money laundering is the process of disguising the origins of money obtained through criminal activities, making it appear as if it comes from legitimate sources.

Criminal activities that generate illicit funds include financial fraud, drug trafficking, arms dealing, corruption, and terrorist financing.

Process of Money Laundering:

- **Placement (Step 1):**
 - Involves the initial entry of "dirty money" into the legitimate financial system.
 - Criminals deposit cash obtained from illegal activities into banks, casinos, or other financial institutions.
- **Layering (Step 2):**
 - Conceals the source of the illicit funds through a series of complex transactions and layers.
 - Money is moved through various accounts, countries, or financial instruments to obscure its origin.
- **Integration (Step 3):**
 - The final stage where laundered money is reintroduced into the economy.
 - Criminals can use the now "clean" money for legitimate investments, purchases, or financial transactions.

Common Methods of Money Laundering:

- **Smurfing:**
 - Involves breaking down large amounts of illicit cash into smaller, less conspicuous sums.
 - These smaller amounts are then deposited into bank accounts by multiple individuals (smurfs) to avoid suspicion.
- **Shell Companies:**
 - Entities with no genuine business operations used to funnel illicit funds.
 - Criminals create fake invoices and financial records to make transactions appear legitimate.
- **Offshore Banks:**
 - Utilization of banks in countries with strict bank secrecy laws.
 - Countries such as the Bahamas, Panama, or Singapore offer anonymity and confidentiality for account holders.
- **Hawala:**
 - A traditional and informal value transfer system used in many parts of the world.
 - Operates without physical movement of money, relying on trusted networks of brokers or dealers.
- **Electronic Money Laundering (EML):**
 - Occurs through online platforms like auctions, gambling websites, or virtual gaming sites.
 - Cryptocurrencies such as Bitcoin have emerged as a new frontier for money laundering due to their pseudo-anonymous nature.
 - The 2015 Paris attacks were partially funded using bitcoins, highlighting the use of cryptocurrencies for illicit activities.

Revised Regulatory Framework for Bharat Bill Payment Systems (BBPS)

Section: Monetary Policy

Objective:

- The Reserve Bank of India (RBI) has introduced a **revised regulatory framework for BBPS to align with developments in the payments landscape.**
- Effective from April 1, 2024, the new framework aims to **streamline bill payment processes, enhance participation, and bolster customer protection.**

Operational Structure:

- BBPS functions on a tiered structure comprising:
 - **NPCI Bharat Bill Pay Ltd (NBBL)** as the Central Unit (BBPCU).
 - **Bharat Bill Payment Operating Units (BBPOUs).**
 - Agent networks of BBPOUs.

Role of NBBL:

- NBBL, a wholly-owned subsidiary of the National Payments Corporation of India (NPCI), serves as the Payment System Provider for BBPS.
- It operates a platform connecting customers and billers, facilitating clearing and settlement activities for transactions routed through the BBPCU.

Responsibilities of NBBL (BBPCU):

- Establish rules, participation criteria, and technical standards for the system.
- **Ensure guaranteed settlement of all transactions via NBBL,** preventing fund flow through any Technology Service Provider (TSP).

Dispute Resolution:

- NBBL must implement a **centralized dispute resolution framework** for end-to-end complaint management.
- **Integrated system for participating entities allows customers and billers** to raise and resolve disputes as per the framework.

Participation of Entities:

- Banks, non-bank Payment Aggregators (PAs), and authorized BBPOUs can participate as Operating Units.
- **Banks and non-bank PAs do not require separate authorization** for BBPS participation.
- Non-bank **BBPOUs must open an escrow account with a Scheduled Commercial Bank exclusively for BBPS transactions.**

Functioning of Non-bank BBPOUs:

- Non-bank BBPOUs act as Payment Aggregators (PAs) when collecting or settling funds with onboarded billers.
- The **BBPOU's payment system is deemed a 'designated payment system' for the maintenance of the escrow account, as per the guidelines.**

The revised regulatory **framework for BBPS by RBI aims to enhance efficiency, transparency, and customer protection in bill payment systems.** It empowers various entities to participate, ensures secure fund management, and establishes a **robust dispute resolution mechanism** for the benefit of customers and billers alike.

NPCI (National Payments Corporation of India):

- NPCI is the umbrella organization for **operating retail payments and settlement systems in India.**
- It is an initiative of the Reserve Bank of India (RBI) and Indian Banks' Association (IBA) under the provisions of the **Payment and Settlement Systems Act, 2007.**
- NPCI plays a crucial role in promoting cashless transactions and digital payments across the country.
- It develops and manages various payment systems like **UPI (Unified Payments Interface), IMPS (Immediate Payment Service), and RuPay.**

BBPS (Bharat Bill Payment System):

- BBPS is a **centralized bill payment system in India** that offers interoperable and accessible bill payment services to customers.
- It enables individuals to **pay their bills online through a single platform.**
- BBPS covers a wide range of billers including **electricity, water, gas, direct-to-home (DTH), telecom, and more.**

NPCI Bharat Bill Pay Ltd (NBBL):

- NBBL is a wholly-owned subsidiary of NPCI.
- It operates as the **Central Unit (BBPCU) in the BBPS framework.**
- **NBBL acts as the Payment System Provider for BBPS,** providing the platform that connects customers and billers.

BBPOUs (Bharat Bill Payment Operating Units):

- BBPOUs are entities authorized to operate as part of the BBPS.
- They function as **intermediaries between customers and billers**, facilitating the bill payment process.
- BBPOUs are responsible for onboarding billers onto the BBPS platform and handling customer transactions.

BBPCU (Bharat Bill Payment Central Unit):

- BBPCU is the Central Unit of the BBPS system, operated by NBBL.
- It serves as the **core infrastructure for the BBPS, overseeing the entire bill payment process.**
- BBPCU sets the rules, standards, and guidelines for participation in the BBPS ecosystem.
- The BBPCU **ensures seamless transactions, proper clearing, and settlement of funds between customers and billers.**

In summary, **NPCI is the overarching organization overseeing payment systems** in India,

BBPS is the bill payment system,

NBBL is the entity managing the BBPS platform as the BBPCU,

BBPOUs are the operational units handling transactions, and

BBPCU is the central infrastructure ensuring the smooth functioning of the entire BBPS ecosystem.

Unified Presentment Management System (UPMS) introduced by NPCI BillPay Ltd. (NBBL) - NPCI BillPay Ltd. (NBBL), a wholly-owned subsidiary of the National Payments Corporation of India (NPCI), has launched a new functionality known as the Unified Presentment Management System (UPMS). **The primary aim of UPMS is to enrich and simplify the process of bill payments in India, offering a more convenient and efficient solution to customers.**

Key Features of UPMS:

- Standing Instructions Setup
- Automated Bill Fetching
- Centralized Infrastructure
- Democratizing Bill Payments
- Opportunity for Fintech and Service Providers
- Real-Time Updates

NBFC-MFIs Proposal to Raise Household Income Limit for Micro Loans

Section: Monetary Policy

The NBFC-MFIs (Non-Banking Finance Company - Microfinance Institutions) are urging the Reserve Bank of India (RBI) to **reconsider the criteria for annual household income limits for providing microloans, citing the growing needs of individual borrowers.** Here's an overview of the situation:

Request for Revised Criteria:

- **Current Income Limit:**
 - The existing annual household income limit for micro loans stands at ₹3 lakh.
- **Proposed Increase:**
 - NBFC-MFIs are requesting an **increase in this limit to approximately ₹5 lakh.**
- **Previous Revision:**
 - The last revision to the income limit criteria was in 2022, when it was raised from ₹1.25 lakh in rural areas and ₹2 lakh in urban and semi-urban areas to a uniform ₹3 lakh.

Industry Insights:

- **Discussion with RBI:**
 - Regarding the income limit revision.
 - Typically, the **RBI does not revise these criteria on an annual basis, but rather every two to three years.**
 - After the conclusion of this financial year, **with a review of numbers and alignment with government schemes and inflation, a case can be made to the RBI for a reevaluation.**
- **Definition of Microfinance Loan:**

- As per RBI, a **microfinance loan is a collateral-free loan provided to a household with an annual income of up to ₹3 lakh.**
- The household, in this context, refers to the **individual family unit consisting of the husband, wife, and their unmarried children.**
- **Loan Size Trends:**
 - The average microfinance loan size has shown an increase, **reaching ₹47,374 in Q3 FY24, compared to ₹41,123 in the previous year and ₹39,512 in Q3 FY22, based on the latest MFIN data.**

Industry Portfolio:

- **Growth and Clientele:**
 - Microfinance operations have added over one crore unique clients in the past financial year.
 - The industry witnessed a **robust growth of 24.6% over the previous financial year**, with the total portfolio reaching ₹3,99,442 crore.
- **Delinquency and Portfolio Health:**
 - Portfolio delinquency has returned to pre-Covid levels, indicating an improvement in the health of the microfinance portfolio.
- **Industry Breakdown:**
 - NBFC-MFIs are the **largest providers of micro credit, holding a loan amount outstanding of ₹1,56,245 crore**, which accounts for 39.1% of the total industry portfolio.
 - Banks follow with 13 entities holding a **total loan outstanding of ₹1,33,759 crore, constituting 33.5% of the micro-credit universe.**
 - Small Finance Banks have a **total loan amount outstanding of ₹70,449 crore, accounting for 17.6% of the market.**
 - NBFCs represent 8.9%, and other MFIs account for 0.8% of the micro-credit universe.

The push for a revision in the annual household income limit for microloans by NBFC-MFIs **reflects the evolving needs of borrowers and the industry's efforts to align with changing economic dynamics.**

Definition of a Microfinance Loan: The RBI revised the definition of a microfinance loan to indicate a collateral-free loan given to a household **having annual income of up to Rs. 3 lakh. Earlier, the upper limits were Rs.1.2 lakh for rural borrowers and Rs.2 lakh for urban borrowers.**

Amit Shah Inaugurates National Urban Cooperative Finance and Development Corporation Limited

Section: Monetary Policy

- **Event:** Union Cooperation Minister Amit Shah inaugurated the **National Urban Cooperative Finance and Development Corporation Limited (NUCFDC).**
- **Purpose:** The umbrella organization aims to **enhance self-regulation and boost the development of Urban Cooperative Banks (UCBs) in India.**
- **Importance:** Mr. Shah emphasized the **need for UCBs to upgrade and adhere to RBI regulations** for sustained competitiveness.
- **Compliance:** The organization will help **prepare small banks for compliance** with the Banking Regulation Act. The **goal is to establish urban cooperative banks in every city, promoting financial inclusion and accessibility.**
- **Collective Strength:**
 - **Branches:** 11,000 branches collectively.
 - **Banks:** 1,500 member banks.
 - **Deposits:** ₹5 lakh crore.
 - **Loans:** ₹3.50 lakh crore.
- **Performance:**
 - **Net NPAs:** Reduced to 2.10%, reflecting improved asset quality.

Conclusion: The inauguration of the National Urban Cooperative Finance and Development Corporation Limited underlines the **government's commitment to the growth and stability of Urban Cooperative Banks.** This umbrella organization aims to **facilitate self-regulation, compliance with banking regulations, and expansion of UCBs across India.**

With a strong collective presence and improved asset quality, **UCBs are poised for enhanced development and greater financial inclusion under this initiative.**

Cooperative Banks: Overview

- Institutions established on a cooperative basis for banking operations.
- Funded through shares, deposits, and loans extended to members at favorable terms.
- Registered under **Cooperative Societies Acts, operating under Banking Regulations Act and Banking Laws (Cooperative Societies) Act.**

Features:

- **Customer Ownership:** Members are customers and owners, with democratic control.
- **Profit Allocation:** Yearly profits are **allocated to reserves and distributed to members.**
- **Financial Inclusion:** Vital for **providing cheap credit to unbanked rural masses.**

Urban Cooperative Banks (UCBs)

Definition:

- Primary cooperative banks in urban and semi-urban areas.
- Traditionally community-centric, now expanded scope of operations.

Challenges Faced:

1. **Financial Sector Trends:** Competition from microfinance, FinTech, NBFCs challenges UCB presence.
2. **Regulatory Challenges:**
 - Dual regulation eliminated, but issues of money laundering persist.
 - Regulatory arbitrage and financial mismanagement concerns.
3. **Decline in Agricultural Lending:**
 - Share in agricultural lending decreased significantly.
4. **Audit and Government Interference:**
 - Limited audits and delays.
 - Historical patronage by the government.
5. **Limited Coverage:**
 - Small size restricts resources and operational scope.

Recent Developments

1. **RBI Actions:**
 - Revised Supervisory Action Framework (SAF) for UCBs in January 2020.
 - Direct supervision of UCBs by RBI via Ordinance in June 2020.
2. **Committee Recommendations:**
 - Proposed **4-tier structure for UCBs** based on deposit size in 2021.
3. **Ministry of Cooperation:**
 - **Establishment of dedicated ministry crucial for cooperative movement.**
4. **Future Steps:**
 - **RBI Interpretation:**
 - Ensuring Act provisions do not disrupt UCBs.
 - **Institutional Reforms:**
 - Transparency in recruitment and robust accounting systems.
 - **Professional Management:**
 - Encouraging new, young professionals in managerial roles.
 - **NAFCUB's Role:**
 - Focus on UCB accounting software, common bylaws.
 - Strive for symmetrical development of UCBs across towns.

National Urban Cooperative Finance and Development Corporation Limited (NUCFDC)

About:

- **Umbrella Body:** Established as an **umbrella organization for Urban Cooperative Banks (UCBs)** in India.
- **Mission:** Aligned with the **goal of 'Sahakar se Samridhi'** (prosperity through cooperatives) to promote self-reliance and economic growth.

- **Objective:** To modernize and strengthen the Urban Cooperative Banking Sector.
- **Function as SRO:** NUCFDC will serve as a **Self-Regulatory Organization for the UCB sector**, ensuring compliance and efficient operations.
- **Specialized Functions:** The corporation will **provide specialized functions and services tailored** to the needs of cooperative banks.
- **Facilitate Communication:** It aims to **facilitate communication between UCBs and regulatory bodies**, addressing challenges faced by the sector.
- **Certification:** Registered by the **Reserve Bank of India (RBI)** as a **Non-Banking Finance Company (NBFC)** under a **Certificate of Registration (CoR)**.

Significance:

- **Promoting Economic Growth:** NUCFDC supports the **urban cooperative banking sector**, indirectly aiding small farmers and weaker sections in expanding their economic activities.
- **Policy Formulation:** Acts as a **bridge between banks and regulators**, assisting state and central governments in making informed policy decisions based on sectoral realities.
- **Financial Assistance:** Aims to **raise capital and utilize it to provide financial support to UCBs**, fostering their growth and development.

Benefits:

- **Technological Advancements:** Introducing new technologies in the **urban Cooperative Banking Sector** to enhance efficiency and coverage.
- **Technology Platform:** Providing a **centralized technology platform to UCBs**, improving service offerings, reducing operational costs, and **addressing technological constraints**.

Conclusion:

The establishment of the **National Urban Cooperative Finance and Development Corporation Limited** marks a **significant step towards modernizing and strengthening the Urban Cooperative Banking Sector** in India.

Acting as an umbrella body and SRO, **NUCFDC aims to facilitate growth, promote financial inclusion, and enhance efficiency through technological advancements**. By providing specialized services and fostering collaboration between banks and regulators, it aims to contribute to the prosperity and self-reliance of the cooperative banking sector and the economy as a whole.

RBI Tasks NPCI Bharat BillPay Ltd. for Interoperable Internet Banking System

Section: Monetary Policy

The Reserve Bank of India (RBI) has taken steps to **accelerate the settlement of funds for merchants by directing NPCI Bharat BillPay Ltd. (NBBL) to implement an interoperable system for Internet Banking**.

RBI emphasizes the benefits **it will bring to various payment transactions such as income tax, insurance premiums, mutual fund payments, and e-commerce**.

Current Scenario and Challenges:

- **Non-Interoperability:** Presently, transactions processed through Payment Aggregators (PAs) lack interoperability. This means that **each bank needs to integrate separately** with different PAs of various online merchants. With multiple PAs in the ecosystem, it **becomes challenging for banks to integrate with each one individually**.
- **Delays and Settlement Risks:** The **absence of a standardized payment system and rules** leads to delays in the receipt of payments by merchants and poses settlement risks.

Objective of the Interoperable System:

- **Facilitate Quicker Settlement:** The primary goal of the new interoperable system is to **expedite the settlement of funds for merchants**, enabling faster and smoother transactions.
- **Simplified Transactions:** By creating an interoperable framework, **customers will no longer need specific arrangements between the merchant's PA and their bank** for payments.

RBI's Approval and Implementation Timeline:

- **Approval to NPCI Bharat BillPay Ltd.:** The RBI has **approved NPCI Bharat BillPay Ltd. to implement the interoperable system for Internet banking transactions**.
- **Expected Launch:** The implementation of this new system is anticipated **within the current calendar year**, promising a more efficient and seamless payment experience.

Benefits for Stakeholders:

1. **Merchants:**
 - Faster and more reliable settlement of funds.
 - Reduced settlement risks and delays in receiving payments.
2. **Banks:**
 - Simplified integration process with a standardized interoperable system.
 - Enhanced efficiency in handling Internet banking transactions.
3. **Customers:**
 - Seamless payment experience without the need for multiple arrangements.
 - Quicker processing of transactions for various services such as insurance, mutual funds, and e-commerce.

Conclusion:

The RBI's directive to **implement an interoperable Internet banking system through NPCI Bharat BillPay Ltd.** marks a significant stride towards streamlining digital payments in India.

NPCI - National Payments Corporation of India

- **About:** NPCI is an **umbrella organization for operating retail payments** and settlement systems in India. It is an **initiative of the Reserve Bank of India (RBI) and Indian Banks' Association (IBA)**.
- **Role:** NPCI develops and **operates payment systems like Unified Payments Interface (UPI), Immediate Payment Service (IMPS), National Electronic Funds Transfer (NEFT),** and more.

NBBL - NPCI Bharat BillPay Ltd.

- **About:** NBBL is a **subsidiary of NPCI, specifically focused on the Bharat Bill Payment System (BBPS)**.
- **Role:** NBBL operates the BBPS, which is a **centralized bill payment system in India that allows users to pay bills and make recurring payments**

BBPS - Bharat Bill Payment System

- **About:** BBPS is a **centralized system in India for payment of bills** and other services.
- **Role:** It provides a **one-stop solution for payment of utility bills**, such as electricity, water, gas, telephone, and more. Users can make these payments through multiple channels, including online platforms, mobile apps, agents, and bank branches.

In brief:

- **NPCI** is the overarching organization responsible for retail payments in India.
- **NBBL** is its subsidiary dedicated to operating the **BBPS**, which is a centralized bill payment system allowing users to pay various bills through different channels.

Reserve Bank of India (RBI) Directive on Card Networks

Section: Monetary Policy

1. **Directive to Card Issuers:**
 - RBI has directed card issuers, **including authorised payment system providers, banks, and non-banks**.
 - They are **instructed not to enter into agreements or arrangements** with card networks that restrict them from using services of other card networks.
2. **Options for Customers:**
 - Card issuers must provide eligible customers with the option to choose from multiple card networks at the time of card issuance.
 - For existing cardholders, this **choice must be offered at the time of the next card renewal**.
3. **Effective Date:**
 - These directives will come into effect six months from the date of issue of the circular.
4. **Authorised Card Networks in India:**
 - The currently authorised card networks in India include:
 - American Express Banking Corp.
 - Diners Club International Ltd.
 - MasterCard Asia/Pacific Pte. Ltd.

- National Payments Corporation of India–Rupay
- Visa Worldwide Pte. Ltd.

5. **Current Practice:**

- Typically, authorised card networks form tie-ups with banks/non-banks for issuing credit cards.
- The **choice of network for a customer's card is decided by the card issuer (bank/non-bank) based on their bilateral agreements with card networks.**

6. **RBI's Observation:**

- Upon review, RBI observed that **some existing arrangements between card networks and issuers limit customer choice.**
- These arrangements do not promote availability of options for customers.

7. **Fresh Agreements:**

- The RBI has asked card issuers and card networks to execute fresh agreements to align with these changes.
- The **directive aims to enhance customer choice and promote competition in the payment system.**

8. **Purpose of the Directive:**

- Issued with the interest of the payment system and public interest in mind.
- Aims to ensure customers have the flexibility to choose card networks that best suit their needs.
- **Promotes a competitive and consumer-friendly environment in the card issuance process.**

This directive from the RBI seeks to empower customers with more choices in selecting card networks, thereby enhancing competition and efficiency in the payment system.

Card Issuer Companies:

What are Card Issuer Companies?

- Card Issuer Companies are **financial institutions or entities responsible for issuing payment cards to consumers**, including credit cards, debit cards, and prepaid cards.

Why Do Card Issuer Companies Exist?

- They exist to provide consumers with **convenient and secure payment options** for transactions, both online and offline.
- Card issuer companies facilitate the use of credit facilities, offer access to banking services, and enable financial transactions globally.

Who are the Stakeholders Involved?

- **Consumers:** Individuals who use payment cards issued by these companies for purchases, payments, and withdrawals.
- **Banks and Financial Institutions:** Often the entities behind card issuer companies, providing the financial backing and infrastructure.
- **Card Networks (Visa, Mastercard, American Express, etc.):** Companies that provide the network for transactions and card acceptance worldwide.
- **Regulatory Authorities:** Governments and financial regulatory bodies overseeing card issuer operations, ensuring consumer protection and market stability.
- **Merchants and Businesses:** Accepting payments made through cards issued by these companies.

Functions and Roles of Card Issuer Companies:

- **Issuance of Payment Cards:**
 - Providing consumers with various types of payment cards, including credit cards, debit cards, and prepaid cards.
- **Setting Credit Limits:**
 - Determining the maximum amount of credit a cardholder can borrow for credit cards.
- **Account Management:**
 - Managing cardholder accounts, processing transactions, monitoring balances, and generating statements.
- **Transaction Authorization:**
 - Approving or declining transactions based on available funds, credit limits, and security checks.
- **Customer Service and Support:**
 - Offering assistance for lost or stolen cards, transaction disputes, billing inquiries, and general customer inquiries.
- **Security Measures:**

- Implementing fraud prevention measures, encryption technologies, and security protocols to protect cardholder data.
- **Fee Structures and Interest Rates:**
 - Establishing fees, charges, annual fees, interest rates, and penalties associated with card usage.
- **Compliance with Regulations:**
 - Adhering to financial regulations, data protection laws, and consumer protection statutes.
- **Partnerships with Card Networks:**
 - Collaborating with card networks to enable card acceptance, processing, and interoperability.

Types of Cards Issued by Card Issuer Companies:

- **Credit Cards:**
 - Offer a revolving line of credit, **allowing cardholders to borrow money up to a certain limit.** Payments are made monthly, and interest may apply on unpaid balances.
- **Debit Cards:**
 - Linked directly to the cardholder's bank account, debiting funds immediately for purchases or withdrawals.
- **Prepaid Cards:**
 - Loaded with a specific amount of funds by the cardholder, used until the balance is depleted.
- **Co-branded Cards:**
 - Issued in partnership with a retail brand, airline, or other organizations, offering rewards, discounts, or benefits specific to that brand.
- **Secured Cards:**
 - Backed by a security deposit, often used by individuals looking to build or rebuild credit.
- **Contactless Cards:**
 - Utilize near-field communication (NFC) technology for quick and secure tap-and-go payments.
- **Corporate Cards:**
 - Issued to employees of companies for business-related expenses, with features for expense tracking and reporting.

Global Banking Regulators Crack Down on G-SIBs

Section: Monetary Policy

- **Background:**
 - **Globally systemic banks (G-SIBs)** are required to hold more capital than smaller domestic banks due to their systemic importance.
 - This distinction is based on various factors, **determining the "bucket" they fall into, and consequently, the extra capital they must hold.**
 - These rules were established a decade ago following the global financial crisis, **during which many banks were bailed out by the money of taxpayers.**
- **Objective of Crackdown:**
 - The **Basel Committee**, which includes global banking regulators, aims to address **"unacceptable" attempts** by major banks to **manipulate rules to avoid heavier capital requirements.**
 - The goal is to prevent **"window-dressing"** tactics used by **banks to lower their G-SIB scores temporarily.**
- **Proposed Measures:**
 - The committee has set out **potential measures** to constrain banks' ability to manipulate their G-SIB scores.
 - This includes requiring banks to report and disclose most G-SIB indicators based on **an average of values over the reporting year**, rather than year-end values.
 - The intent is to prevent **"regulatory arbitrage behavior"** aimed at reducing banks' perceived systemic risk around reporting dates.
- **Impact on Reporting:**
 - Banks participating in the G-SIB assessment exercise would need to provide **more consistent and reliable data** throughout the reporting year.
 - This move aims to ensure that **banks cannot exploit temporary fluctuations in their systemic risk indicators.**

- **Significance of Measures:**
 - These measures are crucial to **maintain financial stability** and prevent a repeat of the 2008 financial crisis.
 - By ensuring that **G-SIBs hold adequate capital**, regulators aim to **protect taxpayers from bearing the burden of bank failures**.
- **Conclusion:**
 - The Basel Committee's proposed measures aim to **strengthen the resilience** of the global banking system.
 - By closing loopholes and **preventing banks from gaming the system**, regulators seek to **enhance transparency** and **reduce systemic risks** posed by G-SIBs.

About Window Dressing:

Window dressing refers to the *practice of manipulating financial statements or transactions to create a more favorable impression of a company's financial position*.

Purpose: Companies engage in window dressing to **make their financial statements appear stronger or more appealing to investors, creditors, or regulators**.

Methods: This can include actions such as:

Timing of Transactions: Shifting certain transactions or sales to the end of a reporting period to inflate revenues.

Asset-Liability Management: Temporarily **removing liabilities from the balance sheet** at reporting dates to improve financial ratios.

Misclassification: Improperly classifying expenses as capital expenditures to **show lower expenses**.

Intentions: The goal of window dressing is **often to present a rosier picture of financial health than actually exists**, which can mislead stakeholders.

G-SIB (Global Systemically Important Bank):

G-SIBs are banks that are **deemed to be of global systemic importance due to their size, complexity, and interconnectedness** with the global financial system.

Designation Criteria: The Financial Stability Board (FSB) assigns G-SIB status based on a bank's systemic importance, considering factors such as:

- Size
- Complexity
- Global activity
- Interconnectedness with other financial institutions

Capital Requirements: G-SIBs are required to hold more capital than smaller banks to ensure they can withstand financial shocks without destabilizing the financial system.

Regulatory Oversight: G-SIBs are subject to **enhanced regulatory scrutiny and supervision** to mitigate risks to financial stability.

Risk Mitigation Measures: The designation aims to **prevent G-SIBs from engaging in risky behaviors that could lead to another financial crisis** like of 2008.

Impact on Operations: Banks classified as G-SIBs **must meet specific requirements, such as submitting recovery and resolution plans, to ensure they can be resolved without taxpayer bailouts** if they fail.

Conclusion:

In essence, "*window dressing*" refers to the *deceptive practice of manipulating financial data*, while "*G-SIBs*" are banks deemed *systemically important to the global financial system*.

The concern arises when **G-SIBs engage in window dressing to present a lower systemic risk profile than is accurate, which can have implications for financial stability and regulatory oversight**. The Basel Committee's measures aim to address these concerns and ensure the integrity of G-SIB assessments.

RBI's Sell/Buy Swap to Address Liquidity Ahead of Tax Outflows

Section: Monetary Policy

The Reserve Bank of India (RBI) recently conducted a \$5-billion sell/buy swap on March 8, 2022, **aimed at augmenting rupee liquidity in the banking system**.

Purpose of the Swap:

- The RBI conducted the **two-year sell/buy swap to enhance dollar liquidity** in the market.

- In a sell/buy foreign exchange swap, a bank buys US dollars from the RBI and agrees to sell the same amount of US dollars at the end of the swap period.

Liquidity Outflows Ahead:

- The banking system is expected to witness outflows of about ₹3.7-lakh crore from March 15 to 20.
- These outflows are primarily due to direct tax and Goods and Service Tax (GST) payments.

RBI's Decision Not to Roll Over:

- The RBI reportedly chose not to roll over the swap, which means banks will receive rupee liquidity, and the RBI will get dollar liquidity.
- By taking this step, the RBI aims to address the liquidity deficit anticipated in the banking system due to the upcoming tax outflows.

Expected Liquidity Boost:

- Tripathi estimates that about ₹40,000 crore of liquidity could accrue to the banking system with the RBI taking delivery of the swap.
- Additionally, the forex reserves of India will receive a boost by an equivalent amount in dollar terms.
- The RBI's decision not to roll over the swap is seen as an effort to alleviate this impending liquidity crunch.

In summary, the RBI's sell/buy swap was a strategic move to manage liquidity ahead of significant tax outflows expected in the banking system. By not rolling over the swap, the RBI aims to infuse rupee liquidity while bolstering its forex reserves with dollar liquidity. This decision is aimed at addressing the liquidity challenges anticipated due to the tax payments in mid-March.

Dollar–Rupee Swap Auction: An Overview

A Dollar–Rupee Swap auction is a strategic foreign exchange (forex) tool used by central banks to manage currency liquidity in the banking system.

Purpose and Function:

- The central bank, such as the Reserve Bank of India (RBI), conducts Dollar–Rupee Swap auctions to either infuse or withdraw liquidity from the banking system.

Types of Dollar–Rupee Swaps:

1. **Dollar–Rupee Buy/Sell Swap:**
 - In this type of swap, the central bank buys US dollars (USD) from banks in exchange for Indian Rupees (INR).
 - Simultaneously, the central bank commits to selling the same amount of dollars back to the banks at a later date.
 - This type of swap is used to inject rupee liquidity into the banking system.
2. **Dollar–Rupee Sell/Buy Swap:**
 - Conversely, in a sell/buy swap, the central bank sells US dollars to banks.
 - In return, the central bank receives an equivalent amount in rupees, effectively reducing the rupee liquidity in the banking system.
 - This type of swap is used to manage excess liquidity or tighten liquidity conditions.

Risk Management:

- Dollar–Rupee Swap auctions are structured to mitigate exchange rate and market risks.
- Transaction terms, including the exchange rate and dates for buying and selling, are predetermined and set in advance.
- This pre-agreed framework helps the central bank and participating banks manage their exposure to currency fluctuations.

Liquidity Management:

- The primary objective of these auctions is to regulate liquidity conditions within the banking system.
- By buying or selling dollars against rupees, the central bank can influence the amount of rupee liquidity available to banks.
- This, in turn, impacts interest rates, credit availability, and overall economic conditions.

Role in Monetary Policy:

- Dollar–Rupee Swap auctions are part of the central bank's monetary policy toolkit.
- They allow the central bank to fine-tune liquidity levels, manage interest rates, and stabilize financial markets.

Benefits and Impact:

- **For Banks:** Participating banks benefit by managing their short-term liquidity needs.
- **For Central Bank:** The central bank **maintains control over the money supply, influencing economic growth and inflation.**

In summary, Dollar–Rupee Swap auctions play a crucial role in the central bank's efforts to manage currency liquidity in the banking system. They provide a mechanism for **injecting or withdrawing rupee liquidity, helping to regulate interest rates, credit availability, and overall economic stability.** These auctions are structured to **minimize risks for both the central bank and participating banks while serving as an essential tool in monetary policy implementation.**

Japan Nears Interest Rate Hike: Financial Markets Gear Up for Transition

Section: Monetary Policy

In a dramatic shift in Japan's financial markets, rising interest rates are looming on the horizon, a phenomenon not seen in decades.

Transition to Rising Interest Rates:

- Japanese financial markets are **preparing for an imminent rise in interest rates**, signaling the end of a long era of monetary policy experimentation.
- The Bank of Japan (BOJ) is expected **to exit its negative short-term rate policy by June, with a possibility of rates rising to zero as early as next week.**

Implications for Financial Instruments:

1. **Government Debt Market:**
 - Investors are positioning themselves to **benefit from selling short-dated government bonds.**
 - A rise in central bank deposit rates **could lead banks to shift capital out of bonds and into cash, impacting the government debt market.**
2. **Foreign Exchange Market:**
 - The market, heavily short on the yen, is **adjusting to paying interest, albeit small, on the Japanese currency.**
 - A reversal in short yen positions has already begun, indicating the market's response to the changing interest rate scenario.
3. **Equity Market:**
 - Equity investors have been optimistic, particularly in bank shares, expecting growth in loans and margins.

Market Expectations and Challenges:

- Investors and policymakers **view higher wages and shifts in corporate attitudes as new factors influencing the interest rate hike.**
- **Longer-term changes in Japan are considered underpriced by markets**, with potential for a longer hiking cycle if consumption and wages support each other.

Challenges Ahead:

- The **transition from unconventional monetary policies will take time** and could have long-lasting effects on the economy.
- Smaller businesses may face challenges **from higher borrowing costs, while crowded bets on bank stocks could see losses.**
- A potential yen rally could trigger global repercussions, **particularly in "carry" trades funded in yen.**

Conclusion:

Japan's journey toward higher interest rates marks a significant shift in its monetary policy landscape. **Financial markets are bracing for these changes, with implications for various asset classes and global trading strategies.** The move reflects Japan's efforts to revive its economy and attract investment, but it also poses challenges in unwinding the distortions of prolonged unconventional policies. As markets adjust to this new era, **investors will closely monitor developments for potential opportunities and risks.**

Zero Interest-Rate Policy (ZIRP):

Zero Interest-Rate Policy (ZIRP) is an **unconventional monetary policy tool used by central banks to stimulate economic growth and combat deflation.**

In a ZIRP environment, the central bank sets its benchmark interest rate at or near zero percent. **The aim is to encourage borrowing, spending, and investment by making the cost of borrowing extremely low.**

1. **Stimulating Economic Activity:** By lowering interest rates to zero, the central bank seeks to encourage businesses and individuals to borrow money for investments, such as capital expenditures or home purchases. This increased spending can stimulate economic growth.
2. **Boosting Consumer Spending:** With lower borrowing costs, consumers may be more inclined to take out loans for big-ticket items like cars and homes. This boosts consumption, which is a key driver of economic activity.

3. **Lowering the Cost of Debt Servicing:** For existing borrowers, ZIRP reduces the cost of servicing debt, freeing up funds that can be spent or invested elsewhere.
4. **Fighting Deflation:** ZIRP is often used in times of deflationary pressure when prices are falling. By encouraging spending and investment, central banks aim to combat deflation and achieve a modest level of inflation, typically around 2%.
5. **Supporting Asset Prices:** Low interest rates can also lead to higher asset prices, such as stocks and real estate, as investors seek better returns than those offered by traditional savings accounts or bonds.

While ZIRP can have positive effects on the economy, there are also potential drawbacks and risks:

1. **Impact on Savers:** With interest rates near zero, savers earn minimal returns on their savings accounts, CDs, and other fixed-income investments. This can be challenging for retirees and those relying on interest income.
2. **Asset Bubbles:** Persistently low interest rates can lead to excessive risk-taking and asset bubbles, as investors chase higher returns in riskier assets.
3. **Limited Effectiveness:** ZIRP may lose its effectiveness over time, especially if it remains in place for an extended period. Central banks may then need to resort to other unconventional monetary policies.
4. **Impact on Banks:** Banks' profitability can be squeezed under ZIRP, as their net interest margins shrink due to lower interest rates on loans.

Negative Interest Rate Policy (NIRP):

Negative Interest Rate Policy (NIRP) takes ZIRP a **step further by setting the central bank's policy rate below zero. In a NIRP environment, banks are effectively charged for holding excess reserves with the central bank, instead of earning interest on those reserves.**

Key features of Negative Interest Rate Policy (NIRP) include:

1. **Encouraging Lending and Spending:** NIRP aims to incentivize banks to lend money rather than hold excess reserves. By charging banks for deposits, central banks hope to spur lending to businesses and consumers, boosting economic activity.
2. **Pushing Down Market Interest Rates:** When the central bank charges negative rates on reserves, it can lead to lower market interest rates on loans and mortgages. This can encourage borrowing and stimulate demand for credit.
3. **Weakening the Currency:** Negative rates can also put downward pressure on a country's currency. When investors earn lower returns on investments denominated in that currency, they may seek higher returns elsewhere, leading to currency depreciation.
4. **Combatting Deflation:** Similar to ZIRP, NIRP is used to combat deflationary pressures and stimulate inflation to reach central bank targets.

While NIRP shares some similarities with ZIRP, it introduces additional complexities and potential challenges:

1. **Impact on Bank Profits:** NIRP can squeeze bank profits even further than ZIRP, especially if they are unable to pass negative rates on to depositors.
2. **Potential for Disruption in Financial Markets:** Negative rates can distort financial markets, leading to unusual behavior such as investors hoarding cash or seeking alternative investments.
3. **Concerns for Savers and Pension Funds:** NIRP poses challenges for savers, pension funds, and insurance companies, which struggle to generate positive returns in a low or negative interest rate environment.
4. **Limits to Effectiveness:** Like ZIRP, NIRP may face diminishing returns if implemented for an extended period, potentially requiring other policy tools to achieve central bank objectives.

Both ZIRP and NIRP are unconventional monetary policies used during times of economic distress or when traditional tools like adjusting interest rates are no longer effective. They come with benefits in terms of stimulating economic activity but also carry risks and challenges that policymakers must carefully consider.

Review of NBFC Categorisation by RBI: Potential Impact and Significance

Section: Monetary Policy

The Reserve Bank of India (RBI) is set to **review the categorisation of Non-Banking Finance Companies (NBFCs) in 2024, nearly two years after introducing a revised regulatory framework.**

This review has become necessary **due to the growth of NBFCs, changes in their business models, and their evolving operations** since the implementation of scale-based regulations.

Purpose of the Review:

- **Evaluation of NBFC Growth:** The review aims to assess the growth trajectory of NBFCs, especially those backed by large corporate houses and conglomerates.

- **Adaptation to Changes:** Given the significant changes in NBFC operations, the review seeks to ensure that regulatory categorisations align with current market dynamics.

Potential Implications:

1. **Focus on Large NBFCs:** The review might specifically focus on NBFCs backed by large corporate entities, considering them for potential re-categorisation.
2. **Precursor to Bank Licences:** There is speculation that the review could serve as a preliminary step towards granting bank licences to select NBFCs.

Potential Candidates for Upgradation:

- NBFCs such as Tata Capital, M&M Finance, L&T Finance, and Bajaj Finance are among the names speculated for upgradation to the top layer.
- Currently, 16 NBFCs are in the upper layer, with nine of them led by large business houses.

Basis of Upgradation:

- **Nuanced Approach:** The RBI is expected to adopt a nuanced approach, considering various parameters for upgradation.
- **Key Parameters:** Factors such as customer grievance handling, technology capabilities, asset quality, in-house operations, management quality, asset-liability management, and liability diversification may be assessed.
- **Case-by-Case Review:** The review process is likely to be case-specific rather than a blanket approach, evaluating each NBFC individually.

Significance of the Review:

- **Alignment with Bank-like Operations:** The review aims to address the perception among some NBFCs in the upper layer that they already function like banks.
- **Regulatory Clarity:** RBI Deputy Governor highlighted the existing differences between regulations for banks and NBFCs, suggesting the need for clarity in the categorization.

Current Regulatory Framework:

- **Scale-Based Regulations:** Implemented in October 2021 and fully enforced a year later.
- **Four Layers:** The regulatory framework includes four layers—base, middle, upper, and top.
- **Asset Composition:** As of September 30, 2023, NBFCs in the base, middle, and upper layers constituted 6%, 71%, and 23% of total NBFC assets, respectively.
- **No NBFC in Top Layer:** Presently, no NBFC is listed in the top layer of the regulatory framework.

The review of NBFC categorisation by the **RBI signals a proactive approach to adapt regulatory frameworks to the evolving financial landscape.**

By evaluating key parameters and potentially considering certain NBFCs for upgradation, the **RBI aims to ensure a more effective and aligned regulatory environment for the non-banking finance sector in India.** This move also underscores the RBI's focus on maintaining the stability and integrity of the financial system amid changing market dynamics.

Non-Banking Financial Company (NBFC): Overview and Features

An NBFC is a company registered under the Companies Act, 1956 or 2013, **engaged primarily in financial activities such as:**

- Providing loans and advances
- Acquiring shares, stocks, bonds, debentures, and other securities issued by the government, local authorities, or other entities
- Engaging in leasing and hire-purchase activities
- Conducting insurance and chit fund businesses

Exclusions:

- An institution is not considered an NBFC if its primary business involves:
 - Agricultural activities
 - Industrial activities
 - Purchase or sale of goods (other than securities)
 - Providing specific services
 - Sale, purchase, or construction of immovable property

Types of NBFCs:

1. **Asset Finance Company (AFC):**

- Mainly finances the purchase of machinery, equipment, and other assets
- Leasing and hire-purchase activities are common
- 2. **Investment Company (IC):**
 - Primarily deals with acquiring securities
 - Invests in shares, stocks, bonds, debentures, etc.
- 3. **Loan Company (LC):**
 - Focuses on providing loans and advances
 - Often provides personal loans, business loans, and other forms of credit
- 4. **Infrastructure Finance Company (IFC):**
 - Specializes in financing infrastructure projects
 - Funds construction of roads, bridges, power plants, etc.
- 5. **Systematically Important Core Investment Company (CIC-ND-SI):**
 - A category of NBFCs that plays a crucial role in the financial system
 - Has a significant impact on the financial stability of the economy

Features of NBFCs:

1. **No Demand Deposits:**
 - Unlike banks, NBFCs cannot accept demand deposits from the public.
 - Demand deposits refer to funds that customers can withdraw on demand, like savings and current accounts.
2. **Non-Participation in Payment System:**
 - NBFCs are not part of the payment and settlement system.
 - They cannot issue checks drawn on themselves, unlike banks that facilitate check-based transactions.
3. **No Deposit Insurance:**
 - Depositors in NBFCs do not have the benefit of deposit insurance provided by institutions like the Deposit Insurance and Credit Guarantee Corporation (DICGC).
 - Deposit insurance protects depositors' funds up to a certain limit in case of the institution's failure.
4. **Focus on Financial Services:**
 - NBFCs primarily focus on providing financial services such as lending, leasing, investment, and insurance.
 - They often cater to specific segments of the market, offering tailored financial products.
5. **Regulated by RBI:**
 - The Reserve Bank of India (RBI) regulates and supervises NBFCs to ensure stability in the financial system.
 - NBFCs must comply with regulatory guidelines, capital adequacy norms, and reporting requirements set by the RBI.
6. **Diverse Business Models:**
 - NBFCs can have diverse business models, ranging from consumer finance to infrastructure financing.
 - They often fill gaps in credit availability, especially for small and medium-sized enterprises (SMEs) and individuals.

Classification of Non-Banking Financial Companies (NBFCs)

The regulatory and supervisory framework for Non-Banking Financial Companies (NBFCs) is **based on a four-tiered structure**. This classification aims to **differentiate between NBFCs based on their systemic importance, potential risks, and impact on financial stability**.

1. **Base Layer: NBFC-Base Layer (NBFC-BL)**
 - NBFCs in the lower layer fall under the **category of NBFC-Base Layer (NBFC-BL)**.
 - **Least regulatory intervention** is warranted for NBFCs in this layer.
 - These NBFCs are considered to have **lower systemic risks and minimal impact** on financial stability.
2. **Middle Layer: NBFC-Middle Layer (NBFC-ML)**
 - NBFCs in the middle layer are designated as NBFC-Middle Layer (NBFC-ML).
 - The regulatory regime for this layer is **stricter compared to the base layer**.
 - Measures can be implemented to address adverse regulatory arbitrage compared to banks.
 - This layer aims to **mitigate systemic risk spill-overs from NBFCs** falling within this category.

3. Upper Layer: NBFC-Upper Layer (NBFC-UL)

- NBFCs in the Upper Layer are known as the NBFC-Upper Layer (NBFC-UL) and will have a new regulatory superstructure.
- This layer includes NBFCs with a **large potential for systemic risks and the ability to impact financial stability**.
- The **regulatory framework for NBFCs in this layer will be more akin to that of banks**, with suitable modifications.
- NBFCs identified in the Upper Layer need to meet specific criteria to remain classified as such.
 - If an NBFC-UL does not meet the classification criteria for four consecutive years, it will move out of the enhanced regulatory framework.

4. Top Layer:

- Ideally, the Top Layer is supposed to remain empty.
- This layer serves as a buffer, **where certain NBFCs from the Upper Layer can be placed if they pose extreme risks**.
- If NBFCs in the Upper Layer are deemed to pose significant risks according to supervisory judgment, they **can be subject to higher and tailored regulatory requirements**.
- This Top Layer of the classification is intended to be a **contingency for extreme risk scenarios and not a standard classification for NBFCs**.

The four-tiered classification of NBFCs aims to create a structured and responsive regulatory framework that aligns with the varying degrees of systemic importance and risk posed by these financial institutions.

Banking Crisis Aftermath: Considerations for Strengthening Banking sector

Section: Monetary Policy

- **Background:**
 - A banking crisis involving Credit Suisse occurred a year ago.
 - Government-sponsored **rescue of Credit Suisse and U.S. bank salvages in March 2023**.
- **Current Situation:**
 - Regulators and lawmakers are beginning to address concerns.
 - Top global financial watchdog warned Switzerland to **strengthen banking controls due to the risk posed by UBS**.
- **Key Weaknesses Identified:**
 - Banks' **liquidity requirements found insufficient**.
 - **Liquidity Coverage Ratio (LCR) is crucial for banks' ability to meet cash demands**.
- **Proposed Changes and Debates:**
 - European regulators discussing shortening the period of acute stress for measuring banks' buffers.
 - Potential for banks **needing to hold higher levels of liquid assets, potentially increasing funding costs**.
 - Industry-wide changes expected in Europe next year, including **final implementation of post-financial crisis rules (Basel III)**.
- **ECB Scrutiny and Central Bank Role:**
 - ECB intensifies scrutiny of liquidity buffers of individual banks to prevent rapid runs.
 - Focus on **making emergency loans widely available and examining collateral requirements**.

The ongoing discussions and **proposed changes aim to enhance banks' resilience against rapid deposit outflows and liquidity stress, ensuring financial stability and preventing crises like those involving Credit Suisse**.

Liquidity Coverage Ratio (LCR):

- The **liquidity coverage ratio (LCR)** is the **ratio of highly liquid assets** held by financial institutions. It ensures their **ability to meet short-term obligations, acting as a stress test for market-wide shocks**.

Basel III Reforms and LCR Implementation:

- Introduced as part of the **Basel III reforms** post-2008 financial crisis.
- Finalized by the **Basel Committee on Banking Supervision** in January 2013.
- LCR formula: $LCR = \text{High-Quality Liquid Asset Amount (HQLA)} / \text{Total Net Cash Flow Amount}$.

Indian Framework for LCR:

- India's framework for LCR requirements issued on June 9, 2014.

- Phased implementation **from January 1, 2015, with minimum mandatory requirements starting at 60%.**
- Gradually increasing to 100% by January 1, 2019.

High-Quality Liquid Assets (HQLA):

- **HQLAs** are assets **quickly convertible to cash with no significant loss of value.** Three categories:
- **Level 1:** Includes coins, banknotes, central bank reserves, and marketable securities.
- **Level 2A:** Securities issued/guaranteed by specific sovereign entities or multilateral development banks.
- **Level 2B:** Investment-grade corporate debt and publicly-traded common stock.

Importance of LCR for Banks:

- Promotes short-term resilience against liquidity disruptions.
- Ensures banks have **sufficient HQLAs to survive acute stress scenarios lasting 30 days.**
- **Banks must hold HQLAs equal to expected total net cash outflows** over the stress period.

Limitations of LCR:

- Requires banks to hold more cash, **potentially leading to fewer loans issued.**
- **Increased cost of maintaining fund ratio** could impact lending and economic growth.
- Banks' cost of lending increases due to the need to cover fund ratio costs.

The Liquidity Coverage Ratio is a **critical measure ensuring banks' ability to weather short-term liquidity disruptions while balancing the need for lending and financial stability.**

Bank of Japan Raises Interest Rates After 17 Years

Section: Monetary Policy

In a significant move, **Japan's central bank, the Bank of Japan (BOJ), has raised its benchmark interest rate for the first time in 17 years.**

- **Policy Shift:**
 - The BOJ has **ended its policy of negative interest rates, which were implemented to stimulate the economy.**
 - The lending rate for overnight borrowing by banks has been **raised to a range of 0% to 0.1%, marking a departure from the previous rate of minus 0.1%.**
- **End of Ultra-Lax Policy:**
 - This rate hike signifies a **shift away from the ultra-lax monetary policy** that has been in place for years.
 - The move indicates the **BOJ's confidence in the economy's recovery and its ability to sustain growth without the need for negative rates.**
- **First Rate Hike in Years:**
 - The rate hike, effective immediately, is the first of its kind since February 2007.
- **Impact on Economy:**
 - The decision to raise interest rates reflects the **BOJ's assessment of the economy's strength and resilience.**
 - It suggests a **more optimistic outlook for Japan's economic recovery** and the need to adjust monetary policy accordingly.
- **Market Response:**
 - The announcement of the **rate hike is likely to have implications for financial markets,** especially in terms of bond yields and the yen's exchange rate.
 - Investors and analysts will closely monitor **how the market responds to this shift in monetary policy.**
- **Forward Guidance:**
 - The BOJ is expected to provide further guidance on its future monetary policy decisions.
 - Clarity on the **central bank's plans for interest rates and asset purchases will be crucial for market participants** and economic stakeholders.

Conclusion

Japan's decision to raise interest rates after nearly two decades marks a significant milestone in its monetary policy. **The move away from negative rates signals the BOJ's confidence in the economy's recovery and its readiness to adjust policy settings** accordingly.

The impact of this rate hike will be closely watched by **market participants, investors, and policymakers** as Japan aims to navigate its post-pandemic economic landscape.

Understanding "Ultra-Lax Monetary Policy"

"Ultra-lax monetary policy" refers to an **approach taken by central banks to stimulate economic activity and boost growth by keeping interest rates exceptionally low or even negative.**

- **Negative Interest Rates:**
 - One key feature of an ultra-lax monetary policy is the **use of negative interest rates**. Central banks set rates below zero, which means commercial banks are charged for holding excess reserves.
- **Quantitative Easing (QE):**
 - Central banks engage in large-scale asset purchases, such as government bonds or mortgage-backed securities, to inject money into the economy.
 - The aim is to **lower long-term interest rates, encourage borrowing and investment, and support asset prices.**
- **Goal of Ultra-Lax Policy:**
 - The primary objective of this policy is to **stimulate economic growth, especially during periods of recession or sluggish activity.**
 - By lowering borrowing costs, central banks aim to **encourage businesses to invest, consumers to spend, and lenders to extend credit.**
- **Challenges and Criticisms:**
 - While ultra-lax monetary policy can provide a boost to the economy, it also comes with risks and challenges.
 - There are **concerns about its impact on savers and retirees who rely on interest income.**
 - It may also **lead to asset price inflation, creating bubbles in financial markets.**
- **Recent Trends:**
 - Following the global financial crisis of 2008, many central banks, **including the Bank of Japan, European Central Bank, and Federal Reserve, adopted ultra-lax policies.**
 - These measures were aimed at **stabilizing economies, promoting recovery, and warding off deflationary pressures.**
- **Impact on Financial Markets:**
 - Ultra-lax policies often lead to **lower bond yields, higher stock prices, and a weaker currency.**
 - Financial markets closely monitor central bank announcements and policy changes for signals on future economic conditions.

In summary, **ultra-lax monetary policy is an unconventional approach used by central banks to provide stimulus to economies facing challenges such as low growth and deflationary pressures.**

India's Proposed Maritime Development Fund

Section: Msc

- **Objective:**
 - The proposed fund aims to provide **long-term, low-cost financial support** to promote indigenous ship-building in India.
- **Expected Timeline:**
 - The fund is likely to be ready by the **end of this year.**
- **Participation:**
 - It will involve **participation from industry stakeholders, financial institutions, and Ministries.**
- **Structural Options:**
 - Two options are under discussion:
 - Setting up a **dedicated maritime vertical** under a proposed development finance institution.
 - Establishing a **standalone company** with multi-agency equity.
 - **Reducing Ship Leasing Costs:**
 - India currently spends about **\$75 billion annually** on leasing ships from outside.

- The aim is to **boost India's ship-building industry to reduce dependence on leasing.**
- **India's Current Tonnage and Goals:**
 - India owns **about 2%** of the world's total tonnage with approximately **1,500 ships** under its flag.
 - The fund aims to **increase India's share to up to 5% of the world's tonnage.**
- **Focus Areas of the Fund:**
 - The Maritime Development Fund will **focus on the entire value chain, including ship-building, flagging, ownership financing, and leasing.**
 - It will also promote **cruise tourism** and activities such as **mechanization** and **capacity expansion** of existing ports **through Public-Private Partnerships (PPPs).**
- **Proposed Corpus and Funding Mechanisms:**
 - The fund is proposed to start with a corpus of **₹25,000 crore** over a **seven-year period.**
 - It will utilize **multiple funding mechanisms** such as debt, equity, Viability Gap Funding (VGF), and buyer credit support.
- **Challenges in Accessing Finance:**
 - Indian shipping companies face challenges in growing tonnage due to difficulties in accessing required finance.
- **Seeking 'Infrastructure' Status:**
 - The Ministry is working with the Finance Ministry to **provide 'infrastructure' status to vessel operators and shipping companies.**
 - This status will enable them to **raise long-term, low-cost finance for the shipping sector.**
- **Government Initiatives:**
 - The Ministry is taking steps to make the **shipping sector more attractive by providing infrastructure status and facilitating access to long-term funds.**
 - The fund will play a crucial role in **boosting India's maritime sector**, enhancing indigenous ship-building capabilities, and reducing leasing costs.

Current Status of Maritime Transport in India:

- **Global Ranking:**
 - India is the **16th largest maritime country** in the world.
- **Trade Volume and Value:**
 - Maritime transport in India handles **95% of trade by volume** and **68% by value.**
- **Ship Recycling:**
 - India is among the **top 5 ship recycling countries**
 - Holds **30% share** in the global ship recycling market.
- **Ship-Breaking Industry:**
 - India owns over **30% global market share** in the ship-breaking industry.
 - The **largest ship-breaking facility** is located in **Alang, Gujarat.**
- **Sagar Mala Program:**
 - Launched in **2017** for **port-led development** and growth of logistics-intensive industries.
- **Port Infrastructure:**
 - India has **12 major** and **200 non-major/intermediate ports** under state government administration.
 - **Jawaharlal Nehru Port Trust** is the largest major port, while **Mundra** is the largest private port.
- **Maritime India Vision 2030 (MIV 2030):**
 - A ten-year blueprint for the maritime sector.
 - Focuses on boosting waterways, shipbuilding industry, and cruise tourism.
 - Aims to develop world-class Mega Ports, transshipment hubs, and modernize port infrastructure.
 - Estimated investments of **₹1,00,000-1,25,000 crore** for capacity augmentation and infrastructure development.

Policy Initiatives and Development Projects:

- **Maritime Development Fund:**

- A **₹25,000-crore fund** to provide low-cost, long-term financing for the sector.
- Centre contributing **₹2,500 crore** over seven years.
- **Port Regulatory Authority:**
 - Establishment of a **pan-India port authority** under the **new Indian Ports Act**.
 - Aimed at enhancing oversight, institutional coverage, and structured growth.
- **Eastern Waterways Connectivity Transport Grid project:**
 - Aims to develop regional connectivity with **Bangladesh, Nepal, Bhutan, and Myanmar**.
- **Riverine Development Fund:**
 - Provides financing for inland vessels through the **Riverine Development Fund (RDF)**.
 - Extending the **tonnage tax scheme** to inland vessels for long-term, low-cost finance.
- **Rationalization of Port Charges:**
 - Making port charges **more competitive** and transparent.
- **Promotion of Water Transport:**
 - Developing waterways as an **alternative means of urban transport**.

Competition Commission of India (CCI) Orders Probe Against Google

Section: Msc

The Competition Commission of India (CCI) has **initiated a probe against Google regarding its User Choice Billing (UCB) system, finding it to be prima facie anticompetitive.**

Background:

- The CCI order comes after four entities approached the CCI, alleging that **Google's UCB system is discriminatory, unfair, and disrupts competition in the app markets** to favor Google's own apps.
- Google introduced the UCB system in September 2022, **allowing app developers offering digital content to provide alternative billing systems (ABS) alongside the Google Play Billing System (GPBS).**
- Under this system, **Google alternative billing systems (ABS) alongside the Google Play Billing System (GPBS).**

Probe Initiation:

- The CCI's investigative wing will conduct the probe and submit a report within 60 days.
- The CCI noted that **homegrown app developers are aggrieved by Google's updated payment policies related to its Google Play Store.**

Service Fee Concerns:

- According to the CCI order, **Google's service fee for both GPBS and ABS substantially exceeds its cost of providing the services.**
- The order suggests that **Google is charging app developers 4 to 5 times its cost, which appears disproportionate to the economic value of the services rendered.**
- This is viewed as an **abuse of dominant position by Google**, as per the CCI order.

Recent Actions:

- In early March, Google started delisting various Indian apps from its Play Store for failing to comply with UCB.
- These apps were **'temporarily' reinstated after government intervention**, pending an appeal by homegrown app developers in the Supreme Court.
- The appeal by local app developers is related to the commission charged by Google for in-app purchases.
- **Internet apps approached CCI and alleged that UCB was GPBS in a newer avatar and was in violation of the antitrust body's earlier order.**

Previous CCI Ruling:

- In October 2022, the CCI **ruled against Google's anti-competitive practices concerning its Play Store policies and imposed a penalty of over ₹936 crore.**
- Following this ruling, Google allowed third-party billing for in-app purchases.

The CCI's probe into Google's UCB system **aims to investigate allegations of anticompetitive behavior and unfair practices, particularly concerning the fees charged to app developers.** This investigation adds to the ongoing scrutiny of tech giants' market practices in India.

Google Play Billing System (GPBS):

The Google Play Billing System (GPBS) is the **default billing system provided by Google for app developers on the Google Play Store.**

When users make purchases within apps (such as for premium features, subscriptions, or digital content), the GPBS handles the transaction process. **With GPBS, Google typically charges a service fee to developers for processing these transactions. The fee can range from 10% to 30%, depending on various factors such as the type of transaction and the region.**

Alternative Billing Systems (ABS) / User Choice Billing System:

In contrast to the GPBS, **alternative billing systems (ABS) offer app developers the option to integrate their own payment systems or third-party payment gateways within their apps.** This allows developers to manage transactions directly, bypassing Google's default billing system, however, under which apps could offer other payment methods such as UPI, credit cards and net banking but this method also attracted a commission rate of 11-26%.

Competition Commission of India

The Competition Commission of India (CCI) is a **regulatory body established by the Government of India to enforce the Competition Act, 2002.**

Overview:

- **Establishment:** The CCI was constituted in March 2009 as a **statutory body responsible for promoting and sustaining competition in markets, preventing anti-competitive practices, and protecting the interests of consumers.**
- **Repeal of MRTP Act:** It replaced the **Monopolies and Restrictive Trade Practices Act, 1969 (MRTP Act)**, following the recommendations of the Raghavan Committee.

Composition:

- The Commission is composed of:
 - One Chairperson
 - Six Members
- These members are appointed by the Central Government.
- The **Chairperson and Members are whole-time members** of the Commission.

Competition Act, 2002:

- **Purpose:** The Competition Act, 2002, was enacted to **promote competition, prevent anti-competitive practices, and ensure fair trade practices** in India.
- **Prohibitions:**
 - **Anti-Competitive Agreements:** The Act prohibits agreements that significantly affect competition.
 - **Abuse of Dominant Position:** It regulates entities that hold a dominant position in a market to prevent abuse of such position.
 - **Combinations:** The Act **regulates mergers, acquisitions, and combinations** that may have an adverse impact on competition.
- **Establishment of CCI and Competition Appellate Tribunal:**
 - The Act led to the establishment of the Competition Commission of India (CCI) as the primary regulatory authority.
 - It also **established the Competition Appellate Tribunal (COMPAT) for hearing appeals against the decisions of the CCI.**
- **Amendments:**
 - The Act was amended in 2007 by the Competition (Amendment) Act to further strengthen competition regulations.
- **Replacement of COMPAT with NCLAT:**
 - In 2017, the **Government replaced the Competition Appellate Tribunal (COMPAT) with the National Company Law Appellate Tribunal (NCLAT).**

The Competition Commission of India plays a crucial role in **promoting fair competition, protecting consumer interests, and ensuring a level playing field** for businesses operating in India's markets.

[EV policy paves way for Tesla entry](#)

Section: Infra

The Union government of India has announced a **new Electric Vehicles (EV) policy** that includes a **significant reduction in import duties for certain electric vehicles**.

This move is **aimed at encouraging global EV manufacturers, such as Tesla, to invest in setting up manufacturing facilities in India**.

Key Points of the New EV Policy:

Reduction in Import Duties:

- Under the new policy, **completely built-up (CBU) electric cars can be imported at a reduced import duty of 15%**.
- This is a substantial decrease from the **previous import duty rates of 60% or 100%** for completely built-up cars.
- Tesla, among other global EV manufacturers, had requested **import duty reductions ranging from 15% to 40% on fully assembled cars, based on their price**.

Criteria for Reduced Import Duty:

- The new policy allows EV passenger cars (e-4W) to be imported with a **minimum Cost, Insurance, and Freight (CIF) value of \$35,000**.
- This **reduced duty rate of 15% will apply for 5 years from the date of issuance of approval** by the Ministry of Heavy Industries.
- There is a **cap of 8,000 on the number of EVs that can be imported at the reduced rate**, with the option to carry over unutilized annual import limits.

Minimum Investment Requirement:

- In order to avail the duty concessions, **manufacturers are required to invest a minimum of ₹4,150 crore in setting up manufacturing facilities in India**.
- The manufacturing facilities must **become operational within 3 years** from the date of issuance of approval by the Ministry.
- Manufacturers must achieve a **minimum Domestic Value Addition (DVA) of 25% within the initial 3-year period, and 50% DVA within 5 years**.

Promoting EV Manufacturing in India:

- The government emphasized that the **scheme aims to promote the manufacturing of electric vehicles in India**.
- The EV sector is expected to grow significantly within the Indian automotive industry in the coming years.
- India is currently the **world's third-largest automobile market and one of the fastest-growing automotive markets**.

Opportunity for Global Transition to EVs:

- India sees itself as having the opportunity to **lead the global transition from conventional internal combustion engine vehicles to more efficient and decarbonized EV technology**.
- The automotive sector in India **contributes over 7.1% to the country's GDP** and is expected to grow substantially, with a **projected market size of ₹24.9 lakh crore by 2030**.

The **new EV policy is part of India's efforts to promote sustainable and environmentally friendly transportation solutions** while also boosting the domestic manufacturing sector and creating employment opportunities.

Key government initiatives in India aimed at promoting the adoption of Electric Vehicles (EVs):

- **Faster Adoption and Manufacturing of Electric Vehicles (FAME) Scheme II:**
 - Provides incentives for EV manufacturers and buyers.
 - Incentives include subsidies, tax rebates, preferential financing, and exemptions from road tax and registration fees.
- **National Electric Mobility Mission Plan (NEMMP):**
 - Sets targets to achieve 6-7 million sales of hybrid and electric vehicles annually from 2020 onwards.
 - Provides fiscal incentives to encourage adoption.
- **National Mission on Transformative Mobility and Battery Storage:**
 - Aims to create a comprehensive ecosystem for EV adoption.
 - Supports the establishment of large-scale battery manufacturing plants in India.
- **Production Linked Incentive (PLI) Scheme:**
 - Offers incentives for the manufacturing of electric vehicles and related components.
 - Designed to boost domestic production and make EVs more affordable.
- **Vehicle Scrappage Policy:**

- Provides incentives for the scrapping of old vehicles.
- Encourages the purchase of new electric vehicles as replacements.
- **Go Electric Campaign:**
 - Aims to raise awareness about the benefits of EVs among the public.
 - Focuses on promoting EV adoption and the development of EV charging infrastructure.
- **Support for Global EV30@30 Campaign:**
 - India is among the countries supporting the global EV30@30 campaign.
 - The goal is to **achieve at least 30% new vehicle sales being electric by 2030.**
- **Charging Infrastructure Development:**
 - The Ministry of Power has issued revised guidelines on charging infrastructure.
 - Mandates the **presence of at least one charging station** within a 3 km grid and every 25 km along highways.
- **EV Charging Facilities in Buildings:**
 - The Ministry of Housing and Urban Affairs has amended the Model Building Bye-laws, 2016.
 - Requires **20% of parking spaces in residential and commercial buildings to be allocated for EV charging facilities.**

India's GDP Growth in Q3 2023-24

Section: National Income

1. **GDP Growth Rate:**
 - Surpassed expectations to rise to a *six-quarter high of 8.4%* in the third quarter (October-December) of 2023-24.
 - This exceeded the *5% estimate* for **Q3 by the Reserve Bank of India (RBI)** and other economists.
2. **Impact on Full-Year Estimate:**
 - Q3 GDP pushed the *full-year estimate to 7.6%* in the second advance estimates.
 - Initial estimate was *3%* released in January.
3. **Sectoral Growth:**
 - Improvement in sectors such as:
 - Manufacturing
 - Mining
 - Construction
 - Trade
 - Hotels
 - Transport
 - Communication
 - Broadcasting services
 - Agriculture sector, however, recorded a *contraction* in Q3.
4. **Divergence in Growth Rates:**
 - Divergence between *GDP and Gross Value Added (GVA)* growth rates.
 - GDP for Q3 was *4%*, while GVA growth was lower at *6.5%*.
 - GVA measures national income from the output side, excluding product or indirect taxes.
5. **Reasons Behind Surge in GDP:**
 - Strong growth in sectors except agriculture.
 - Manufacturing grew at *6%*.
 - Construction posted *5%* growth.
 - Services, such as trade, hotels, transport, communication, grew at *7%*.
6. **Investment Support:**
 - Rise in *investments* supported GDP growth.
 - Revival in *capex cycle* due to:

- Turn in real estate cycle
- Industry utilization back at 2019 levels.

7. **Consumption Expenditure:**

- Slowdown in *private final consumption expenditure*.
- FY23 growth levels at a *two-decade low* (excluding pandemic year).
- Q3 private final consumption expenditure rose by 5% year-on-year.

8. **Growth Revisions:**

- Revisions made to growth rates of previous financial years.
- Q3 growth rate revised down to 3% for October-December 2022-23.

9. **Divergence Between GVA and GDP:**

- Sharp rise in *net taxes* and fall in *subsidies*.
- Widening difference to *190 basis points* in Q3.

10. **Government's View:**

- Divergence due to *fall in subsidies*.
- *Urea subsidy* 25% lower than the year-ago period.

11. **Growth Expectations and Concerns:**

- Expectation for broad-based improvement in *consumption growth* and *private investments*.
- Concerns about *slowing profit growth* and rising *input costs*.
- GDP deflator growth expected to impact real GDP growth in FY25.

12. **Future Outlook:**

- Growth momentum expected to *moderate*.
- *Urban demand* could moderate as *wage growth slows*.
- Government *capital expenditure* may slow in Q4.

India's GDP growth in Q3 2023-24 reflects a **mixed picture with strong performances in certain sectors, a slowdown in consumption, and a divergence between GDP and GVA growth rates**. The outlook for future growth hinges on **factors such as consumption demand, private investments, and government spending**.

Understanding GDP and GVA in India's Economic Growth

What is GDP?

- Gross Domestic Product (GDP) measures the **monetary value of all final goods and services produced within a country's borders in a specific time period**.
- It includes **consumption, government spending, investments, and net exports**.

Components of GDP:

- **Private Final Consumption Expenditure (PFCE):** Money spent by individuals on final goods and services.
- **Government Final Consumption Expenditure (GFCE):** Government spending on goods and services.
- **Gross Fixed Capital Expenditure (Gross Investment):** Investments in capital assets to boost productivity.
- **Net Exports (NX):** Difference between exports and imports.

Calculation:

$$\text{GDP} = \text{PFCE} + \text{Gross Investment} + \text{GFCE} + (\text{Exports} - \text{Imports})$$

What is GVA?

- Gross Value Added (GVA) calculates the value of goods and services produced in an economy, minus the cost of inputs and raw materials.
- It provides insights into the contribution of each sector to the economy.

GVA Calculation:

$$\text{GVA} = \text{Total Output Value} - \text{Cost of Intermediary Inputs}$$

Relationship Between GDP and GVA

- **Derived Relationship:**
 - GDP is derived from GVA along with taxes earned by the government and minus subsidies provided.

- **GDP = GVA + Taxes - Subsidies**
- **Usage:**
 - GDP is more **commonly used for analyzing annual economic growth** and for comparisons between countries or over time.
 - GVA helps understand the **performance of individual sectors within the economy**.

Recent Indian Economic Growth Data

- **Q2 FY23 Growth:**
 - India's **GDP grew by 6.3% and GVA by 5.6%**.
 - India maintained its status as the fastest-growing major economy, outpacing China.

Significance of GDP and GVA

- **Economic Indicators:**
 - GDP and GVA serve as crucial indicators of an economy's health and performance.
 - They reflect **overall economic activity, sector-wise contributions, and growth trends**.
 - Government policies and decisions **often rely on GDP and GVA data**.

Conclusion

Understanding GDP and GVA is essential for comprehending India's economic growth story. The recent growth rates reflect a **positive trajectory, with implications for policy, investment, and sectoral development**. As India aims for sustained growth, these indicators will continue to guide economic strategies and decisions, ensuring a path of prosperity and progress.

Indian Start-ups Urge CCI to Intervene in Google App Removal Dispute

Section: National Income

A group representing Indian start-ups has taken its battle against Google to the **Competition Commission of India (CCI), requesting the regulator to mandate the reinstatement of apps removed by Google for alleged policy violations**.

This move marks an escalation in the ongoing conflict with the U.S. tech giant within a crucial market.

Background:

- **Google's Action:** On a recent Friday, Google acted by removing over 100 Indian apps from its platform, **citing violations of its policies**. Notable apps were among those removed.
- **Policy Violations:** The apps were removed due to non-compliance with Google's policy, which **requires payment of a service fee when in-app payment options** other than Google's are utilized.
- **Antitrust Directive:** This dispute is further fueled by the backdrop of an antitrust directive from 2022. The **directive, aimed at tech giants like Google, prohibits them from taking adverse actions against companies using alternate billing systems**.

Start-ups' Appeal to CCI:

- **Anticompetitive Allegations:** The Alliance of Digital India Foundation (ADIF) urging the CCI to intervene in the matter and labeled Google's app removal as a "brazen move" that is anticompetitive in nature. The group believes that **Google's actions are detrimental to the market's competitiveness and requested CCI to instruct Google to reverse its decision, emphasizing the potential "irreparable harm" that Google's actions could cause to the entire market**.

Google's Response and Public Criticism:

- **Denial of Wrongdoing:** Google has **denied any wrongdoing** in this matter and refrained from commenting on the letter sent to CCI.
- **Criticism from Indian Companies:** The app removal has garnered criticism from Indian companies, many of which have had **longstanding disagreements with Google over its practices**.

Key Points:

1. **Market Impact:** The dispute between Google and Indian start-ups has **wider implications for the Indian app market's competitiveness and the freedom of companies** to use alternate billing systems.
2. **Regulatory Intervention:** ADIF's appeal to the CCI reflects a **growing demand for regulatory oversight and intervention to ensure fair practices** in the digital ecosystem.
3. **Awaiting Response:** Both Google and the CCI have yet to respond to the recent developments, leaving the **fate of the removed apps and the broader market dynamics** in question.

Conclusion:

The clash between Google and Indian start-ups over app removals **underscores the challenges faced by tech platforms operating in India's burgeoning digital landscape.**

With calls for regulatory scrutiny and demands for fair competition growing louder, the outcome of this dispute will be closely watched by stakeholders across the industry.

Competition Commission of India

The Competition Commission of India (CCI) is a **regulatory body established by the Government of India to enforce the Competition Act, 2002.**

Overview:

- **Establishment:** The CCI was constituted in March 2009 as a **statutory body responsible for promoting and sustaining competition in markets, preventing anti-competitive practices, and protecting the interests of consumers.**
- **Repeal of MRTP Act:** It replaced the **Monopolies and Restrictive Trade Practices Act, 1969** (MRTP Act), following the recommendations of the Raghavan Committee.

Composition:

- The Commission is composed of:
 - One Chairperson
 - Six Members
- These members are appointed by the Central Government.
- The **Chairperson and Members are whole-time members** of the Commission.

Competition Act, 2002:

- **Purpose:** The Competition Act, 2002, was enacted to **promote competition, prevent anti-competitive practices, and ensure fair trade practices** in India.
- **Prohibitions:**
 - **Anti-Competitive Agreements:** The Act prohibits agreements that significantly affect competition.
 - **Abuse of Dominant Position:** It regulates entities that hold a dominant position in a market to prevent abuse of such position.
 - **Combinations:** The Act **regulates mergers, acquisitions, and combinations** that may have an adverse impact on competition.
- **Establishment of CCI and Competition Appellate Tribunal:**
 - The Act led to the establishment of the Competition Commission of India (CCI) as the primary regulatory authority.
 - It also **established the Competition Appellate Tribunal (COMPAT) for hearing appeals against the decisions of the CCI.**
- **Amendments:**
 - The Act was amended in 2007 by the Competition (Amendment) Act to further strengthen competition regulations.
- **Replacement of COMPAT with NCLAT:**
 - In 2017, the **Government replaced the Competition Appellate Tribunal (COMPAT) with the National Company Law Appellate Tribunal (NCLAT).**

The Competition Commission of India plays a crucial role in **promoting fair competition, protecting consumer interests, and ensuring a level playing field** for businesses operating in India's markets.

Income and Wealth Inequality in India

Section: National Income

- **Historical Highs:**
 - India's top 1 per cent income share in 2022-23 was **6 per cent.**
 - The top 1 per cent wealth share rose to **1 per cent.**
 - *India's top 1 percent income share is among the very highest globally, surpassing countries like South Africa, Brazil, and the United States.*
- **Co-Authored Paper:**
 - The paper compares the **current "Billionaire Raj" in India to the historical British Raj in terms of inequality.**
 - Co-authored by economists *Nitin Kumar Bharti, Lucas Chancel, Thomas Piketty, and Anmol Somanchi.*

- **Tax System and Wealth:**
 - The **Indian tax system might be considered regressive** when viewed from the lens of net wealth.
 - The paper suggests a **restructuring of the tax code**.
 - A levy of a "**supertax**" of **2 per cent** on the net wealth of the **167 wealthiest families** could yield **5 per cent of national income in revenues**.
- **Public Investments:**
 - Calls for **broad-based public investments in health, education, and nutrition**.
 - These investments are crucial to enable the average Indian to benefit from globalization.
- **Analysis of Income Data:**
 - Data analyzed from **annual tax tabulations** by Indian income tax authorities from **1922-2020**.
 - The **top 10 per cent income share** fell from **37 percent in 1951** to **30 per cent by 1982**, then began rising steadily.
 - By the **most recent years, the top 10 percent share nearly touched 60 per cent**.
- **Income Disparity:**
 - The **bottom 50 per cent** receives only **15 per cent** of India's national income in **2022-23**.
 - The **top 1 per cent** earns on average **Rs 5.3 million**, which is **23 times** the average Indian income.
 - In contrast, the **richest 10,000 individuals** earn on average **Rs 480 million**, which is **2,069 times** the average Indian income.
- **Distribution of Income:**
 - The top 0.1 per cent in India earned nearly **10 per cent** of the national income in **2022**.
 - The top 0.01 per cent earned **3 per cent** share, and the **top 0.001 per cent earned 2.1 per cent of the national income**.
- **Factors Contributing to Inequality:**
 - *Public and private sector wage growth* might have played a role till the late 1990s.
 - **Capital incomes** likely played a role in subsequent years.
 - Lack of *quality broad-based education* focused on the masses has kept the shares of the *bottom 50 per cent* and *middle 40 per cent*

The paper emphasizes the **need for a restructuring of the tax system, increased public investments, and addressing factors contributing to income inequality** to enable broader economic benefits for all segments of society.

Aspects of inequality of India

Section: National Income

Context:

- A new working paper, titled **"Income and Wealth Inequality in India, 1922-2023: The Rise of the Billionaire Raj"**, by **World Inequality Lab** has estimated that **"inequality declined post-independence till the early 1980s, after which it began rising and has skyrocketed since the early 2000s"**.

More on news:

- The paper, which has been co-authored by **Nitin Kumar Bharti, Lucas Chancel, Thomas Piketty, and Anmol Somanchi**, combines data from national income accounts, wealth aggregates, tax tabulations, rich lists, and surveys on income, consumption, and wealth to arrive at the results.

Here are the main takeaways:

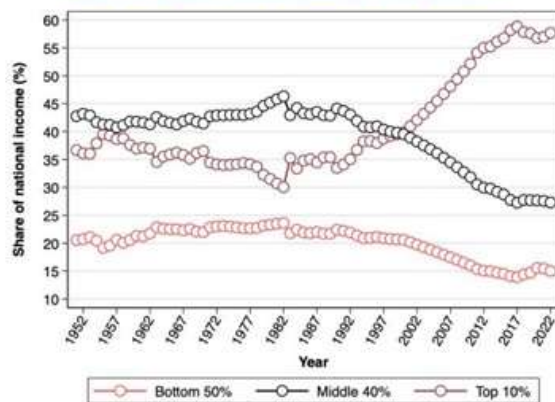
Growth in average incomes

- According to the **WIL paper, between 1960 and 2022, India's average income grew at 2.6% per year in real terms** (that is, after removing the effect of inflation).
- This period can be broadly divided into two halves: **"Compared to a real growth rate of 1.6% per year between 1960 and 1990, average incomes grew by 3.6% per year between 1990 and 2022"**.
- It further states that the periods **2005-2010 and 2010-2015 saw the fastest growth at 4.3% and 4.9% per year respectively**.

Emergence of very high net worth individuals

- The period between 1990 to 2022 witnessed a rise in national wealth and the emergence of very high net worth individuals (those with net wealth exceeding \$1 billion at market exchange rate; this number increased from 1 to 52 to 162 in 1991, 2011 and 2022 respectively).

Figure 4: Long-run income inequality in India, 1951-2022



Note: The figures presents the distribution of pre-tax per-adult net national income.

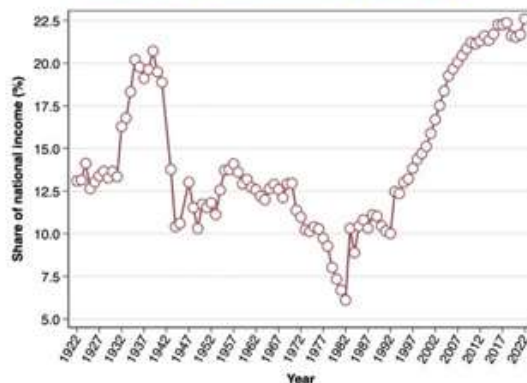
Rise in the percentage of income tax payers

- The paper finds that the share of the adult population that filed an income tax return — which had remained under 1% till the 1990s — **also grew significantly with the economic reforms of 1991.**
- By 2011, the share had crossed 5% and the last decade too saw sustained growth with around 9% of adults filing a return in the years 2017-2020.

Extreme levels of inequality in India

- The paper finds that in 2022-23, 22.6% of India's national income went to just the top 1%, the highest level recorded in the data series since 1922 — **this is higher than even during the inter-war colonial period.**
- The top 1% wealth share stood at 40.1% in 2022- 23.

Figure 5a: Top 1% national income share, 1922-2022

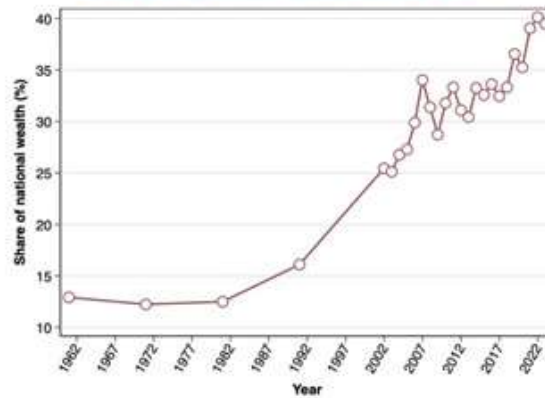


Note: The figure presents the distribution of pre-tax per-adult net national income.

Extreme wealth concentration at the very top

- Most of these gains came post-1991 after which point top 1% shares have been on a steep upward trend right until 2022-23.
- The wealth concentration within the top 1% as well is extreme.

Figure 10a: Top 1% National wealth share, 1961-2023

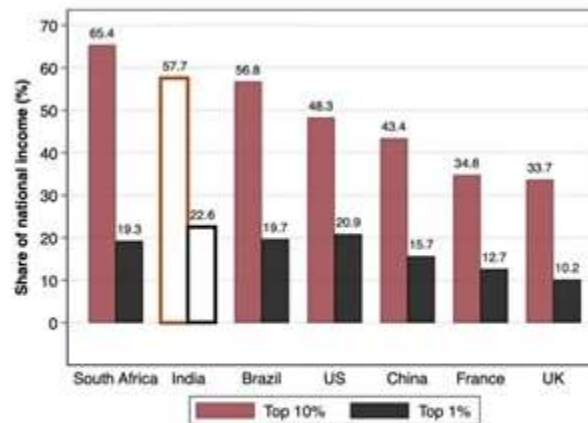


Note: The figure presents the distribution of per-adult national wealth.

International comparison of income inequality

- In the paper, the authors put India's income and wealth inequality levels (as of 2022) in global perspective by comparing India with **Brazil, China, France, South Africa, United Kingdom, and the United States**.
- If one looks at the **income share of the top 10%, India stands second only second to South Africa**.
- If, however, one compares the income share of the **top 1%, India ends up having the highest levels at 22.6%**.

Figure 15a: Top income shares in global perspective, 2022-23

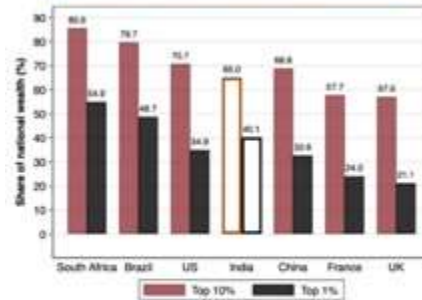


Note: The figure compares India's top 10% and top 1% income shares with a handful of countries that include some of the most unequal ones. In 2022-23, India's top 1% income was not only the highest among these countries but among the very highest anywhere in the world.

International comparison of wealth inequality

- The picture is slightly less extreme when wealth inequality is considered.
- In terms of top wealth shares (Figure 15b), we see that both with top 10% and top 1%, India comes out in the middle of the pack, with Brazil and South Africa standing out with their extreme wealth concentration levels (85.6% and 79.7% top 10% shares respectively).

Figure 13b: Top wealth shares in global perspective, 2022-23



note: The figure compares India's top 10% and top 1% wealth shares with a handful of countries that include some of the most unequal ones. In 2022-23, India's top 1% wealth share was higher than the US and China and closing in fast on Brazil.

Poor data leading to likely underestimation of inequality

- Notwithstanding such stark findings, emphasized that the quality of economic data in India is notably poor and has seen a decline recently.
- It is therefore likely that our results represent a lower bound to actual inequality levels.

Policy solution

- Implementing a super tax on Indian billionaires and multimillionaires, along with restructuring the tax schedule to include both income and wealth, so as to finance major investments in education, health and other public infrastructure, could be effective measures.

Employment scenario in India grim, says ILO report

Section: Unemployment and inflation

Context:

- The **India Employment Report 2024** reveals **significant shifts in the employment landscape of India**, especially among the youth.

About the report:

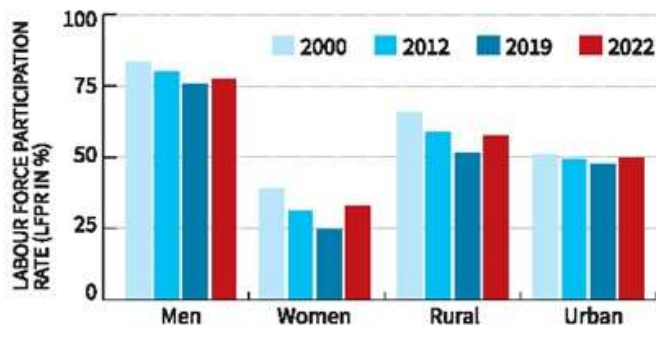
- It is a collaborative effort between the **International Labour Organisation (ILO)** and the **Institute of Human Development (IHD)**.
- Released by **Chief Economic Adviser V. Anantha Nageswaran**.
- The report highlights **trends in education levels among the unemployed and broader employment patterns over two decades up to 2022**.

Key findings:

- The report illustrates a **stark increase in the share of unemployed youth with secondary or higher education in India**, which nearly **doubled** from **35.2% in 2000** to **65.7% in 2022**.
 - **Youths** represent almost **83%** of the **country's unemployed workforce**.
- Despite an **increase in employment and underemployment** from **2000** to **2019**, the **pandemic years saw a decline**.
- The report points to a **long-term deterioration in key labour market indicators (Labour Force Participation Rate, Worker Population Ratio, and Unemployment Rate)** up until **2018**, followed by an **improvement post-2019**, coinciding with **economic distress periods**.
- The **improvement in labour market indicators** during **periods of economic slowdown** prompts **caution**, raising questions about the **quality and sustainability of jobs** created during these times.
- The report also touches on the **paradoxical nature of India's employment scenario** over the past two decades, highlighting **insufficient growth in non-farm sectors** and their capacity to absorb agricultural workers.
- This situation underscores ongoing challenges in transforming India's employment landscape despite some positive indicators.

Employment blues

Labour participation for various sections increased slightly in 2022 (compared to 2019) but was still low vis-a-vis 2000



Key definitions:

- **Labour Force Participation Rate (LFPR):**

- **LFPR** is the number of persons in the **labour force** as a **percentage of the working-age population**.
- The **LFPR** is a measure of the **proportion of a country's working-age population** that **engages actively in the labour market**, either by working or looking for work;
- It provides an **indication** of the **size of the supply of labour available to engage in the production of goods and services**, relative to the population at working age.
- The breakdown of the **labour force** (formerly known as the **economically active population**) by sex and age group gives a profile of the distribution of the labour force within a country.
 - $LFPR (\%) = 100 \times \text{Labour force} / \text{Working-age population}$

- **Worker Population Ratio (WPR):**

- **WPR** is defined as the **ratio of a country's working population to its population** multiplied by **100**.
- **Symbolically**,
 - $\text{Worker population ratio} = \text{Total number of Workers} / \text{Total Population} \times 100$
- If the ratio is higher, it means that the engagement of people is greater.
- If this ratio is medium or low, it means that a very high proportion of the population of its population is not involved directly in economic activities

- **Unemployment Rate (UR):**

- The unemployed are people of working age who are without work, are available for work, and have taken specific steps to find work.
- The **unemployment rate** is the percentage of people in the labour force who are unemployed.

State of employment in India: What a new report says about youths and women, concerns and caution

Section: Inflation and unemployment

Context:

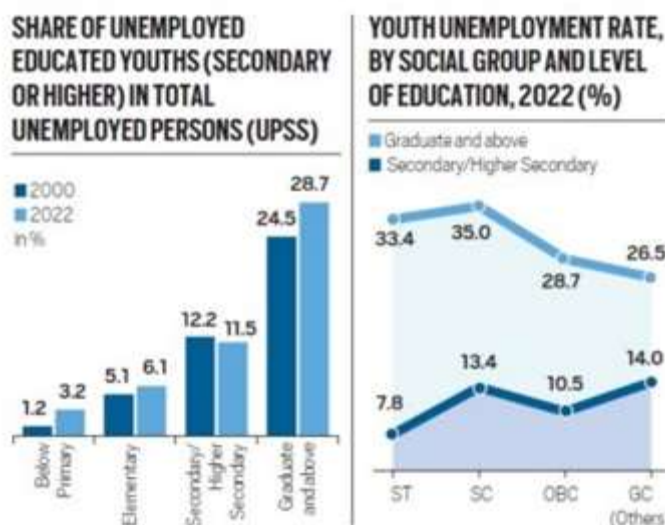
- **India Employment Report 2024** is recently released by the **International Labour Organisation (ILO)**.

The index is based on seven labour market outcome indicators:

- percentage of workers employed in regular formal work;
- percentage of casual labourers;
- percentage of self-employed workers below the poverty line;
- work participation rate;
- average monthly earnings of casual labourers;
- unemployment rate of secondary and above-educated youth;
- youth not in employment and education or training.

The report has flagged concerns about poor employment conditions:

- The slow transition to non-farm employment has reversed;
- Women largely account for the increase in self-employment and unpaid family work;
- Youth employment is of poorer quality than employment for adults;
- Wages and earnings are stagnant or declining.



Report findings:

- The ‘**employment condition index**’ has **improved** between **2004-05** and **2021-22**. But some states — **Bihar, Odisha, Jharkhand, and UP** — have **remained** at the **bottom** throughout this period, while some others — **Delhi, Himachal Pradesh, Telangana, Uttarakhand, and Gujarat** — have **stayed at the top**.

Segment	Findings	Increased/Decreased
Informal employment	<ul style="list-style-type: none"> • Almost 82% of the workforce is engaged in the informal sector, and nearly 90% is informally employed. 	<ul style="list-style-type: none"> • Increased
Self-employment	<ul style="list-style-type: none"> • Remains the primary source of employment — 55.8% in 2022. • Self-employment and unpaid family work has increased, especially for women. 	<ul style="list-style-type: none"> • Remained almost stable around 52% between 2000 and 2019. • This reversed by 2022, with self-employment increasing to 55.8%,
Casual employment	<ul style="list-style-type: none"> • Accounted for 22.7% 	<ul style="list-style-type: none"> • Consistently declined to 22.7% in 2022 from 33.3% in 2000.
Regular employment	<ul style="list-style-type: none"> • Accounted for 21.5% 	<ul style="list-style-type: none"> • Increased by almost 10 percentage points, to 23.8% from 14.2% between 2000 to 2019, and then decreased to 21.5% by 2022.
Participation of women	<ul style="list-style-type: none"> • The female labour force participation rate (LFPR) in India remains among the world’s lowest. • There is a considerable gender gap — women’s LFPR (32.8%) in 2022 was 2.3 times lower than men’s (77.2%). • India’s low LFPR is largely attributed to the low female LFPR, which was much lower than the world average of 47.3% in 2022, but higher than the South Asian average of 24.8%. 	<ul style="list-style-type: none"> • Declined by 14.4 percentage points (compared to 8.1 percentage points for males) between 2000 and 2019.

Structural transformation	<ul style="list-style-type: none"> The share of agriculture in total employment fell to around 42% in 2019 from 60% in 2000, which is absorbed by construction and services (share in total employment increased to 32% in 2019 from 23% in 2000.) The share of manufacturing in employment has remained almost stagnant at 12-14%.
Youth employment and Underemployment	<ul style="list-style-type: none"> Both increased between 2000 and 2019 but declined during the pandemic years. In 2022, the share of unemployed youths in the total unemployed population was 82.9%. The share of educated youths among all unemployed people also increased to 65.7% in 2022 from 54.2% in 2000. The unemployment rate among youths was six times greater for those who had completed secondary education or higher (18.4%) and nine times higher for graduates (29.1%) than for persons who could not read or write (3.4%) in 2022. This was higher among educated young women (21.4%) than men (17.5%), especially among female graduates (34.5%), compared to men (26.4%). The unemployment rate among educated youths grew to 30.8% in 2019 from 23.9% in 2000, but fell to 18.4% in 2022.
Social Inequalities	<ul style="list-style-type: none"> Schedule castes (SCs) and Schedule tribes (STs) lag in terms of access to better jobs. SCs and STs have greater participation in workforce due to economic necessity but engaged more in low-paid temporary casual work and informal employment. Despite improvement in educational attainment among all groups, the hierarchy within social groups persists.

Major recommendation:

- There are **five key policy areas** for further action: promoting job creation; improving employment quality; addressing labour market inequalities; strengthening skills and active labour market policies; and bridging the knowledge deficits on labour market patterns and youth employment.

Environment

On sustainable building materials

Section: Sustainable development

Context:

- India** is witnessing an **unprecedented construction boom**, with over **3,00,000** housing units erected annually. This growth brings **economic opportunities** and **improved living standards** but also poses **significant environmental challenges**.

Details:

- The **building sector**, a major **energy consumer**, accounts for over **33%** of **India's electricity usage**, contributing to **environmental degradation** and **climate change**.
- The **India Cooling Action Plan** forecasts an **eight-fold increase** in **cooling demand** between **2017** and **2037**, emphasising the need for **thermal comfort** while **reducing active cooling demand**.

How can the construction sector become energy efficient?

- The **construction sector** can **increase its energy efficiency** by focusing on **reducing energy and cooling demands**, exacerbated by **economic growth, urbanization, and climate change**.
- Implementing measures like the **Eco-Niwas Samhita (ENS)** and the **Residential Energy Conservation Building Code** are pivotal.
 - Eco Niwas Samhita (ENS)** is a **Residential Energy Conservation Building code** developed by **BEE**.
 - The code sets **standards** to **limit heat gain and loss** and **ensure adequate natural ventilation** and **daylighting potential**.
 - The **Ministry of Power** launched the **Energy Conservation- New Indian Way for Affordable & Sustainable Homes (ECO Niwas)** in **2018**.

- The ENS introduces the **Residential Envelope Transmittance Value (RETV)**, a measure of **heat transfer** through a **building's envelope**, advocating for an **RETV of 15W/m2 or less** to **enhance indoor cooling efficiency, occupant comfort, and reduce utility costs**.
- Despite these **guidelines**, the prevailing construction practices rely on **quick, energy-intensive methods** emphasizing **active cooling**, compromising **thermal comfort**.
- There's a notable gap in **awareness** regarding **climate-appropriate design and architecture**, partly due to **misconceptions** about the **initial costs of constructing climate-responsive buildings**.
- This highlights the need for a shift in perception and increased educational efforts towards sustainable building practices.

What materials are optimal?

- In **warmer climates** across **four Indian cities**, the study found **Autoclaved Aerated Concrete (AAC) blocks, red bricks, fly ash, and monolithic concrete (Mivan)** to be popular building materials.

Building materials	Description
<p>1. Autoclaved Aerated Concrete (AAC) blocks</p>	<p>AAC is concrete that has been manufactured to contain closed air pockets. AAC is one-fifth the weight of concrete.</p> <p>AAC blocks can be used for loadbearing structures up to 3 storeys, and AAC panels can be used for cladding.</p> <p>AAC has medium thermal mass and provides very good thermal insulation.</p> <p>AAC is relatively easy to work with but can also be easily damaged. Specific construction techniques are required.</p> <p>AAC used externally should be coated with a vapour-permeable, water-resistant finish. Render to blockwork must be a proprietary mix compatible with the AAC substrate.</p>
<p>2. Fly ash</p>	<p>A by-product of combustion of coal in electric utility or industrial boilers.</p> <ul style="list-style-type: none"> • It can be used as a building material for various purposes. • It's commonly used as structural fill for road construction and fly ash can be used to make bricks, ceramic tiles, plaster, Portland cement, and ready-mix cement. • Other building materials that may contain fly ash include hot mix asphalt, grout fill, wallboard, concrete pipes, and concrete bricks. <p>Benefits:</p> <ul style="list-style-type: none"> • Cost-effective alternative to Portland cement • Increases durability and workability of concrete • Helps prevent cracking or expansion and reduces permeability • Resistant to sulphates and alkali-aggregate reactions • Recycles coal burning waste and reduces CO₂ emissions <p>Challenges:</p> <ul style="list-style-type: none"> • Longer drying and setting times • Delayed setting in cold climates • Slow strength development in cold climates • Air-entraining admixtures may be necessary • Requires safe disposal according to EPA regulations
<p>3. Monolithic concrete or Mivan technology</p>	<ul style="list-style-type: none"> • Mivan Shuttering is a fast-paced construction technology which offers strength and durability to a building by use of Aluminum Framework System. • Mivan Technology reduces the construction time by almost the half in comparison to conventional practices. It minimizes the need of skilled labour and completely eliminates the labour intensive activities such as masonry and rendering. • On the structural front, the technology makes the buildings more seismic-resistant and durable, since there are lesser number of joints, the building faces reduced leakages, hence requiring negligible maintenance.

Comparison of these materials:

- **Monolithic concrete** is preferred by developers for **high-rise buildings** due to its **speed, strength, quality, and scalability**, being chosen for over **60%** of buildings currently in design and construction phases.
- However, **AAC blocks** stood out in **RETV evaluations**, demonstrating the **lowest heat transfer values across various climates**, thus identifying them as **thermally efficient**.
- Comparative analysis showed **monolithic concrete** has **significantly higher embodied energy** — **75 times more than AAC blocks** for the same wall area, indicating a **greater environmental impact**.
- **Red bricks**, while requiring the **most construction time**, have **moderate embodied energy** but contribute to **resource depletion and waste**.
- **Mivan technology**, on the other hand, allows for the **fastest construction**, especially beneficial for **taller buildings**.
- Despite the **environmental and sustainability concerns** associated with each material, **AAC blocks** emerge as a preferable option. They strike an effective balance between **low embodied energy** and **efficient construction time**, making them a more environmentally friendly choice compared to red bricks and monolithic concrete, which have higher embodied energies and associated environmental impacts.

Challenges and prospects:

- Current reliance on materials like **Mivan**, despite its efficiency, poses sustainability issues due to its **high embodied carbon and poor thermal comfort**.
- The challenge for the construction industry is to innovate and produce building materials that are not only **cost-effective** and **scalable** but also **durable, fire-resistant**, and **offer excellent thermal performance and climate resilience**.
- There's a need for **interdisciplinary collaborations** focusing on **integrated design** to improve aspects such as **building orientation, Window Wall Ratio (WWR), U-value (heat transfer rate) of building components, glazing performance, and active cooling systems**.

Worrying biodiversity loss in Finnish coastal waters: report

Section: Biodiversity

Context:

- A report from Finnish experts, published on March 22, highlights the **threat of biodiversity loss in Finland's coastal waters**, attributing it mainly to **eutrophication and climate change**.

Key findings:

- The **Finnish Nature Panel's first study on Finland's coastal marine environment** revealed **45 forms of biodiversity loss**, primarily **characterized by the local disappearance of species and declines in others**.
 - **Finland's unique Baltic Sea waters**, characterized by **brackish and shallow conditions**, are home to distinct organisms.
- The report raises concerns over the **decline of key species** like **bladderwrack, eelgrass, and the blue mussel**.
- **Coastal ecosystems**, crucial for **carbon and nutrient sequestration, oxygen production, and maintaining fish stocks**, are significantly affected by **eutrophication and climate change**.
- **Eutrophication**, driven by **agricultural runoff, forestry, and wastewater**, poses the **greatest threat to marine biodiversity**, with **no coastal water areas in Finland currently in good condition regarding this issue**.
- Despite some recovery signs, **coastal regions have not achieved a satisfactory ecological status**.
- The **Baltic Sea's** rapid changes due to **climate change** exacerbate the situation. To halt **biodiversity loss** and **meet international goals**, the **Nature Panel** advocates for enhanced marine area protection and integrating nature conservation into decision-making processes.
- The ecosystem is vulnerable due to **its low diversity of invertebrates**, which are crucial to the **food web**. The **loss of any species could have irreplaceable impacts on the ecosystem's function**.

Baltic sea:

- The **Baltic Sea** is an arm of the **Atlantic Ocean** that is enclosed by **Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, Sweden, and the North and Central European Plain**.
- The **Baltic Sea drains** through the **Danish Straits** into the **Kattegat** by way of the **Øresund, Great Belt and Little Belt**. It includes the **Gulf of Bothnia** (divided into the Bothnian Bay and the Bothnian Sea), the **Gulf of Finland**, the **Gulf of Riga** and the **Bay of Gdańsk**.



Fighting warming: when gasses are contraband

Section: Climate change

Context:

- A California man is facing criminal charges for smuggling greenhouse gasses (GHGs).

Greenhouse Gasses (GHGs):

- **Atmospheric gasses like carbon dioxide, methane, nitrous oxide (N₂O), water vapor, and chlorofluorocarbons** are capable of trapping the out-going infrared radiation from the earth's surface thereby causing greenhouse effect.
- Hence these gasses are known as greenhouse gasses and the heating effect is known as greenhouse effect.

About Refrigerants:

- A refrigerant is a working fluid used in the refrigeration cycle of air conditioning systems and heat pumps where in most cases they undergo a repeated phase transition from a liquid to a gas and back again.

About HFCs:

- **Hydrofluorocarbon (HFC)**, any of several organic compounds composed of hydrogen, fluorine, and carbon.
- HFCs are produced synthetically and are used **primarily as refrigerants**.
- They became widely used for this purpose beginning in the late 1980s, **with the introduction of the Montreal Protocol, which phased out the use of chemicals such as halons and chlorofluorocarbons (CFCs) that contribute to the depletion of Earth's ozone layer.**

About HCFC:

- HCFCs are compounds containing **carbon, hydrogen, chlorine and fluorine**.
- Industry and the scientific community view certain chemicals within this class of compounds as acceptable temporary alternatives to chlorofluorocarbons.
- **HCFC-141 b is one of the most powerful ozone-depleting chemicals** after Chlorofluorocarbons (CFCs).
- **Nearly, 50 % of the consumption of ozone depleting chemicals in the country was attributable to HCFC-141 b in the foam sector.**

About Montreal Protocol:

- The **1987 Montreal Protocol on Substances that deplete the Ozone Layer** and its succeeding amendments were subsequently negotiated to control the consumption and production of anthropogenic (ODSs) and some hydrofluorocarbons (HFCs).
- The Protocol was signed by **197 parties in 1987 to control the use of ozone-depleting substances, mainly chlorofluorocarbons (CFCs)**.
- The Montreal Protocol mandated the **complete phase-out of CFCs and other ozone-depleting substances (ODS)**, which it has successfully managed to do in the last three decades.
- **CFCs were gradually replaced, first by HCFCs, or hydrochlorofluorocarbons**, in some cases, and eventually by HFCs which have minimal impact on the ozone layer.

- The adoption of the 2016 Kigali Amendment to the Montreal Protocol will phase down the production and consumption of some HFCs and avoid much of the projected global increase and associated climate change.
- Under Kigali it was agreed to phase down the consumption of HFCs by 80% by 2047.

Warming up to climate change: Why do global sea surface temperatures matter?

Section: Climate change

Context:

- The average **global sea surface temperature (SST)** for February 2024 stood at 21.06 degree Celsius, the highest ever in a dataset that goes back to 1979.

More on news:

- The previous record of **20.98 degree Celsius was set in August 2023.**
- Almost 90 per cent of the extra heat trapped by **greenhouse gasses has been absorbed by the oceans, making them steadily warmer over the decades.**
- Between 1982 and 2016, such heat waves have doubled in frequency and have become longer and more intense, according to a 2021 study by the **UN's Intergovernmental Panel on Climate Change (IPCC).**
- In 2023, the concentration of GHG reached the highest levels ever recorded in the atmosphere, according to C3S.

Graphical Representation of the sea surface temperatures:

- Since March 2023, the average daily SST has been off the charts.
- While the orange line shows 2023's temperatures, other gray lines track temperatures of previous years.
- The solid back line represents where we are so far in 2024 and it is way above any other previous year, including 2023.

Why are the oceans getting warmer?

- **Carbon dioxide, methane, ozone, and nitrous oxide** are some of the notable GHGs, which essentially trap heat in the atmosphere and contribute to global warming.
- As a result, the **average global temperature has risen at least 1.2 degree Celsius** above pre-industrial times.
- Almost 90 per cent of the extra heat trapped by **GHGs has been absorbed by the oceans, making them steadily warmer over the decades.**
- Apart from global warming, there are other factors which have led to a spike in ocean temperatures.
- For instance, El Niño — a weather pattern that refers to an abnormal warming of surface waters in the equatorial Pacific Ocean — has contributed to both ocean warming and rising global surface temperatures.
- There is also less dust blowing off the **Sahara Desert recently due to weaker-than-average winds.**
- **The dust forms a “giant umbrella that shades”** the Atlantic water and reduces ocean temperatures.
- But now, the umbrella has partially folded and more of the Sun is beating down on the ocean.

Why are rising sea surface temperatures a cause of worry?

- Higher ocean temperatures can have **irreversible consequences for marine ecosystems.**
- Warmer oceans lead to an increase in ocean stratification — **the natural separation of an ocean's water into horizontal layers by density, with warmer, lighter, less salty, and nutrient-poor water layering on top of heavier, colder, saltier, nutrient-rich water.**
- The rise in temperatures, however, has made it harder for water layers to mix with each other. Due to this, oceans are able to absorb less carbon dioxide from the atmosphere and the oxygen absorbed isn't able to mix properly with cooler ocean waters below, threatening the survival of marine life.
- Nutrients are also not able to travel up to the surface of the oceans from below.
- This could threaten the population of phytoplankton, single-celled plants that thrive on the ocean surface and are the base of several marine food webs.
- Phytoplankton are eaten by **zooplankton, which are consumed by other marine animals such as crabs, fish, and sea stars.**
- If The **phytoplankton population plummets, there could be a collapse of marine ecosystems.**
- **Warmer oceans cause marine heat waves (MHWs),** which occur when the surface temperature of a particular region of the sea rises to 3 or 4 degree Celsius above the average temperature for at least five days.

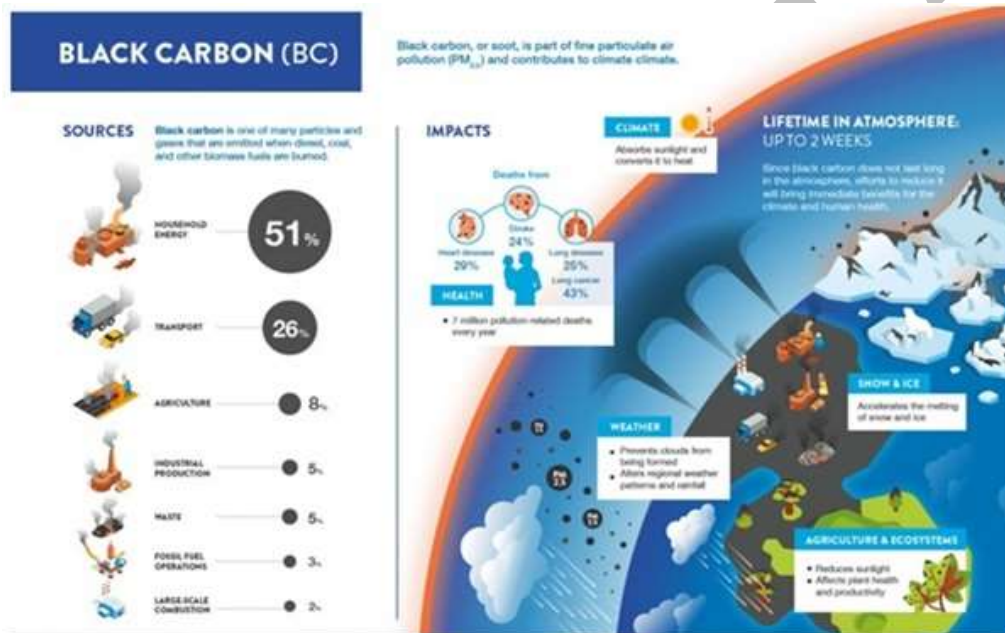
- MHWs are devastating for **marine ecosystems as they contribute to coral bleaching**, which reduces the reproductivity of corals and makes them more vulnerable to life-threatening diseases. They also impact the migration pattern of aquatic animals.
- **Higher ocean temperatures** may also result in more frequent and more intense storms like hurricanes and cyclones.
- Warmer temperatures lead to a higher rate of evaporation as well as the transfer of heat from the oceans to the air.
- **When storms travel across hot oceans, they gather more water vapor and heat.**
- This results in more powerful winds, heavier rainfall, and more flooding when storms reach the land — meaning heightened devastation for humans.

The need to curb black carbon emissions

Section: Climate change

Context:

- At the **COP26 climate talks in Glasgow** in November 2021, **India** pledged to achieve **net-zero emissions by 2070**. According to the **Ministry of New and Renewable Energy, India** had **installed a renewable energy capacity** of over **180 GW by 2023** and is expected to meet its **target of 500 GW by 2030**.



Types of Carbon	
Black Carbon (BC)	<ul style="list-style-type: none"> • It is a component of fine particulate matter of the size 2.5 µm. It consists of pure carbon, which originates from the incomplete combustion of fossil fuels, coal, biofuel, biomass, wood, rubber, etc. It is emitted in the form of soot.
Brown Carbon (BrC)	<ul style="list-style-type: none"> • It is brown smoke released by the combustion of organic matter. It coexists with black carbon when released into the atmosphere. • It is one of the significant warming factors as it disturbs the temperature pattern of the atmosphere and the cloud-forming process. It also changes the solar absorption pattern and the nature of clouds.
Difference between Black Carbon (BC) and Brown Carbon (BrC)	<ul style="list-style-type: none"> • BrC and BC differ in their ability to absorb radiation, with BC strongly absorbing radiation at all visible wavelengths, whilst BrC primarily absorbs radiation at low visible and near-ultraviolet wavelengths. This distinction is significant as it has the potential to impact the Earth's radiation balance • Soot is an airborne mass of impure carbon particles resulting from the incomplete combustion of hydrocarbons. It originates from pyrolysis.
Blue Carbon (BIC)	<ul style="list-style-type: none"> • It is the carbon captured by the world's oceans and coastal ecosystems.

	<ul style="list-style-type: none"> • This carbon is captured by living organisms in oceans and is stored in the form of aquatic biomass. • Seagrasses, mangroves, and marshes are types of vegetated coastal blue carbon ecosystems, these habitats have a cover of approximately 49 million hectares worldwide. • Blue carbon ecosystems act as the major sink for capturing atmospheric carbon and reducing warming effects.
Green Carbon (GrC)	<ul style="list-style-type: none"> • It is the carbon captured into terrestrial plant biomass in photosynthesis and stored in the plants and soil of natural ecosystems and is a vital part of the global carbon cycle.
Difference between Blue Carbon (BIC) and Green Carbon (GrC)	<ul style="list-style-type: none"> • Green carbon reflects the carbon sequestered by land ecosystems and incorporates carbon in soils and within biomass such as trees in forests. • Blue carbon, by contrast, describes the carbon sequestered in the ocean, the definition of which originally focused on mangroves, salt marshes and seagrasses, but now also includes seaweed, sediments more broadly, and even carbon sequestered by whales.

Why is black carbon relevant?

- Black carbon is a significant environmental and health concern, emitted from the incomplete combustion of biomass and fossil fuels.
- It has been linked to global warming and various health risks, including heart disease, birth complications, and premature death.
- In India, a substantial portion of black carbon emissions comes from the residential sector, primarily due to the use of traditional cookstoves burning biomass like cow dung or straw.
- A 2016 study indicates that the residential sector accounts for 47% of India's black carbon emissions, followed by industries at 22%, diesel vehicles at 17%, open burning at 12%, and other sources contributing 2%.
- While decarbonisation efforts have reduced emissions from industry and transport, reducing residential black carbon emissions remains a significant challenge.

Has PMUY helped?

- The Pradhan Mantri Ujjwala Yojana (PMUY), launched in May 2016 by the Government of India, aimed to provide free liquefied petroleum gas (LPG) connections to below-poverty-line households, facilitating access to clean cooking fuel, reducing reliance on traditional fuels, and thus lowering black carbon emissions.
- By January 2024, the program had successfully distributed connections to over 10 crore households, along with establishing necessary infrastructure like gas stoves and a distribution network.
- Challenges:
 - Despite these achievements, challenges remain. In 2022-2023, data revealed that 25% of PMUY beneficiaries, amounting to 2.69 crore people, did not go beyond zero or one LPG refill annually, indicating a significant reliance on biomass for cooking.
 - Further findings in August 2023 showed that PMUY households use an average of 3.5-4 LPG cylinders yearly, which is lower than the 6-7 cylinders used by non-PMUY households, suggesting that traditional fuels still meet up to half of their energy needs.

What is the government's role?

- The government plays a crucial role in improving quality of life by providing access to clean cooking fuels, particularly LPG, as a transitional step towards renewable energy for rural communities.
- Despite increasing the LPG subsidy from ₹200 to ₹300 in October 2023, and further announcing a price reduction of ₹100 in March 2024, the cost of LPG cylinders, which stands at around ₹600 even after subsidies, remains prohibitively high for many PMUY beneficiaries.
- This issue is compounded by the availability of 'free' traditional fuels like cow dung and firewood. With an estimated ₹12,000 crore allocated for PMUY subsidies in the fiscal year 2024-2025.
- A promising solution is the local production of coal-bed methane (CBM) gas, which offers a cleaner alternative with lower emissions and can be produced by composting biomass at the village level.
- On the global stage, India's efforts to reduce black carbon emissions through initiatives like PMUY can position the country as a leader in addressing health concerns and climate change, aligning with its commitment to the Sustainable Development Goals.

- Mitigating residential emissions could prevent over **6.1 lakh deaths annually** from **indoor air pollution**, highlighting the global health and environmental benefits of such initiatives.

How much should develop countries pay for climate action?

Section: Climate change

Context:

- At a two-day meeting that concluded in Copenhagen, Denmark, on March 22 — the first minister-level climate meeting for this year — some technical work to arrive at the NCQG was finalized.

More on news:

- The 2022 climate change conference in Sharm el-Sheikh decided to set up a Loss and Damage Fund to help developing countries recover from climate disasters.
- The Dubai conference last year was all about **Global Stocktake, or GST**, a review of ongoing climate action, which resulted in the first ever explicit acknowledgment of the need to “transition away” from fossil fuels, and a promise to triple global renewable energy capacity by 2030.
- This year, the focus is on finance. The expression that is likely to be heard most frequently in climate conversations and at COP29, scheduled for November 11-24 in Baku, Azerbaijan, is NCQG — or New Collective Quantitative Goal (on finance).

What is the New Collective Quantitative Goal?

- The **New Collective Quantified Goal on Climate Finance (NCQG)** is a new global climate finance goal that the Conference of the Parties serving as the meeting of the **Parties to the Paris Agreement (CMA)** shall set from a floor of **USD 100 billion per year, prior to 2025**.
- NCQG is a convoluted way to describe the new amount that must be **mobilized by developed countries every year from 2025** onward to finance climate action in developing countries.
- This new amount has to be higher than the \$100 billion that developed countries, collectively, had promised to raise every year from 2020, but had failed to deliver.
- **NCQG is extremely important for developing countries**, and discussions on this new amount have been ongoing for a couple of years at least.

How much money is required to ensure effective climate action?

- The scale of annual climate finance flows has always been considerably less than the \$100 billion that the developed countries had promised to mobilize every year from 2020 onward.
- It would be only a small fraction of the money that is required to enable actions that would keep the world on the 1.5 degree Celsius pathway at least until 2030.
- In 2021, UN Climate Change, the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC), said in a report that developing countries would require a total of about \$6 trillion annually between then and 2030 just to implement their climate action plans.

What are the prospects for a realistic new annual climate finance target?

- In a recent submission made to UN Climate Change, India called upon developed countries to ensure that the NCQG was “at least US\$1 trillion per year, composed primarily of grants and concessional finance”. India’s submission was one of several inputs that will feed into the ongoing discussions on the NCQG.
- UN Climate Change, which organizes dozens of climate meetings every year and facilitates the implementation of various decisions and agreements, depends heavily on contributions from countries and voluntary organizations for carrying out its work.

How will this money be used?

- The new amount, even if far from sufficient for the climate challenge the world faces, will be higher than the current commitment of \$100 billion, since that is the mandate of the NCQG.
- The way the new sum is distributed across different kinds of needs — mitigation, adaptation, loss and damage, and several others — will also be important. Climate finance flows are currently heavily skewed in favor of mitigation actions, while developing countries have been demanding that more money be made available for adaptation and other activities.

About COP29:

- The 2024 United Nations Climate Change Conference or Conference of the Parties of the UNFCCC, more commonly known as **COP29, will be the 29th United Nations Climate Change conference**.
- COP29 will be held in **Baku, Azerbaijan**.

About Loss & Damage (L&D) Fund:

- First announced in **2022 at the conclusion of COP-27 in Sharm El-Sheikh, Egypt.**
- A **‘transitional committee’ was set up to decide the working conditions of the fund.**
- It will be based at the World Bank but managed by an independent secretariat.
- **The World Bank will be the “interim host” of the fund for a period of four years.**
- Payments are voluntary and a certain percentage has been set apart for a category of countries called Least Developed Countries and **Small Island developing states.**
- Commitments worth at least \$450 million have already been made by countries.
- Contributors include: **European Union, United Arab Emirates, Germany, the United States, the United Kingdom, and Japan.**

Researchers call Australia carbon credit scheme a ‘catastrophe’

Section: Climate Change

Carbon Credit Scheme of Australia:

- The scheme covers almost **42 million hectares**, an expanse larger than **Japan**, making it **one of the world's most extensive natural carbon offset initiatives.**
- Since **2013**, it's claimed that these forests have absorbed over **27 million tonnes of carbon.**
- The country **aims to reduce carbon emissions by 43% by 2030 from 2005 levels**, targeting **net-zero emissions by 2050.**

Issues with this carbon credit scheme:

- Despite being **prone to climate-induced natural disasters**, **Australia is a significant exporter of gas and thermal coal.**
- **Australia’s per capita carbon dioxide emissions are among the highest globally at 15.3 tonnes**, surpassing **U.S. levels.**
- This overview encapsulates the recent **critical examination of Australia's carbon credit scheme**, highlighting its **alleged inefficiencies** and the **broader implications for the country's climate policy and international commitments.**

Research Methodology:

- Utilizing **satellite imagery to monitor forest growth**, the study reveals substantial discrepancies in the **reported carbon sequestration**, casting doubt on over **27 million tonnes of absorbed carbon claims.**

Key Findings:

- A **major reforestation project aimed at carbon offset in Australia's Outback** is found to be significantly underperforming, described by researchers as a **“catastrophe” and “gross failure.”**
- Nearly **80% of the targeted land for native forest regeneration** showed **stagnant growth or diminishing woodlands**, challenging the effectiveness of these **carbon offset efforts.**
- Despite questionable outcomes, **Australia has claimed millions of tonnes in carbon credits** from these projects, intended to counteract emissions from polluting industries.

Kerala government declares wildlife attacks a State-specific disaster

Section: Env legislation and organization

Context:

- On March 6, the **State Cabinet of Kerala** declared **human-wildlife conflict a State-specific disaster**, acknowledging the **rising incidents of deaths, injuries, and property losses due to wildlife encroachments from forests.**

Details:

- The declaration enables **Kerala State Disaster Management Authority (KSDMA)** to actively engage in mitigating such conflicts.
- A **high-level committee** chaired by **Chief Minister Pinarayi Vijayan** has been established to address the **wildlife threat**, particularly towards **plantation workers and tribal communities**. This committee includes **Forest, Revenue, Local Self-Governments**, and **SC/ST Welfare Ministers**, along with their department secretaries.
- **District-level committees**, led by the **Minister in charge of the district** and including **District Collectors** and **heads of various departments like KSDMA**, will also be formed.
- An **inter-state coordination committee** with **Karnataka and Tamil Nadu officials** will oversee forest areas adjoining the **three states**, aiming for a unified approach to managing human-wildlife conflicts.

Community Involvement:

- **Neighbourhood watch groups** will be created to **enhance vigilance** and provide **early warnings of wildlife presence and movement**.
- **Volunteer groups, wildlife enthusiasts, and environmentalists** have been enlisted to assist in containing human-wildlife conflicts.

Operational and Surveillance Enhancements:

- The **Chief Wildlife Warden** has been appointed as the **nodal officer for conflict prevention**, overseeing a **24/7 control room**.
- Recruitment of additional **forest watchers** to **improve wildlife monitoring**.
- **Plantation managers** are instructed to clear undergrowth for **better visibility and tracking of wild animals**.
- The **Forest Department** is directed to form **more rapid response teams** equipped with **firearms, surveillance devices, tranquiliser guns, etc.**
- Initiatives to provide **sufficient fodder and water** within **protected reserves** to **deter wildlife from encroaching on human habitats**.

Compensation and Funding:

- Expedited compensation for wildlife attack victims, exempting payments from treasury restrictions.
- **Kerala Infrastructure Investment Fund Board (KIFFB)** is tasked with raising **₹210 crore** for protective measures like fences, moats, and early warning systems near forest boundaries.

Resorts near tiger reserves have turned choice wedding destinations: Supreme Court

Section: Env legislation and organization

Context:

- The **Supreme Court** criticized the **rapid growth of resorts around tiger reserves**, which are increasingly being used as **venues for weddings**, causing **disturbances with loud music that disrupts the forest habitat**.

Details:

- **Justice B.R. Gavai**, in a judgment regarding the **illegal tree felling in the protected Jim Corbett National Park**, highlighted this issue as part of a broader concern about commercial activities undermining the ecological balance of protected forest areas.
- The Supreme Court has ordered the **formation of an expert committee** by the **Ministry of Environment** to **recommend regulations on the establishment of resorts near protected areas**. This committee is **tasked with determining the acceptable number and types of resorts and specifying restrictions on noise levels within a certain distance from protected forests**.
- Highlighting the **government's role as a trustee of natural resources**, the court emphasized that **these resources should not be converted into private ownership or used for commercial purposes in a way that compromises their aesthetic value and ecological integrity**.
- The **Supreme Court** stated that any **encroachment on natural resources for private, commercial, or any other use** should **only be permitted** if deemed necessary for the **public good** and in the **public interest**, maintaining a firm stance on protecting the environment and ecosystems of the country.

Laws related to tree felling in India:

- In India, aspects related to trees are covered under the **Indian Forest Act, 1927**
- It is broadly under this Act that each state has laid down rules and regulations against tree felling.

Along with that various states have come up their own laws for the same purpose like-

- Maharashtra (Urban Areas) Preservation of Trees Act 1975
- Delhi Preservation of Trees Act (1994)
- Karnataka Preservation of Trees Act 1976
- West Bengal Trees (Protection and Conservation in Non-Forest Areas) Act, 2006
- Also, various cities like Gurugram, Chennai etc. come up with their own notifications regarding felling of trees

Cutting OF RESERVED TREES and FORESTS:

- Under **Indian Forest Act, 1927, Section 30**– The State Government may, by notification in the Official Gazette,
 1. declare any trees or class of trees in a protected forest to be reserved from a date fixed by, the notification;

2. declare that any portion of such forest specified in the notification shall be closed for such term, not exceeding thirty years, as the State Government thinks fit, and that the rights of private persons, if any, over such portion shall be suspended during such terms

Section 33 Indian Forest Act:

- Penalties for acts in contravention of notification under **section 30**
- **Any person who-**
 - fells any tree reserved under section 30, or strips off the bark or leaves from, or otherwise damages, any such tree;
 - permits cattle to damage any such tree;
 - shall be punishable with imprisonment for a term which may extend to six months, or with a fine which may extend to five hundred rupees, or with both.
- **Is it punishable to cut trees even on my own premises?**
 - Yes, according to the **Indian Forest Act**, the penalty for cutting down a tree is **Rs.10,000** or **3 months imprisonment**.
 - This punishment may extend up to one year under various state acts.
 - But in some cases like where a tree is blocking your way, whose branches are spreading to your house or blocking hoardings, you need to take a clearance from the Forest department, before cutting that tree.

Meant to reduce stress on big cats, why safari parks may be a double-edged sword

Section: Env law and body

Context:

- On March 6, the **Supreme Court** expressed its willingness to **approve the creation of a Tiger Safari at Pakhrau** within the **buffer zone** of the **Corbett tiger reserve**. This initiative is intended **exclusively for local tigers** that are injured, have been involved in conflicts, or are orphaned, explicitly excluding tigers from zoos.

What is tiger safari?

- A "**tiger safari**" is a concept that emerged within the realm of **wildlife tourism**, specifically **aimed at facilitating the viewing of tigers within their natural or semi-natural habitats**.
- Although **not explicitly defined under The Wildlife (Protection) Act, 1972**, the idea gained formal recognition in the **Guidelines for Tourism** issued by the **National Tiger Conservation Authority (NTCA)** in **2012**.
- These guidelines envisaged **tiger safaris within the buffer areas of tiger reserves, primarily to manage the high tourist influx in the core habitats critical for tiger conservation**.
- By **2016**, the NTCA had issued more **specific guidelines for establishing Tiger Safaris in buffer and fringe areas of tiger reserves**, explicitly for **rehabilitating injured, conflicted, or orphaned tigers**.
- These **guidelines** emphasized that **tigers for these safaris should not be sourced from zoos**. However, in a notable shift in policy in **2019**, the NTCA **permitted the introduction of animals from zoos into tiger safaris** and delegated the responsibility of selecting such animals to the **Central Zoo Authority (CZA)**.
- The **Supreme Court**, however, has criticized the idea of **housing zoo tigers or other captive animals in tiger habitats**, highlighting the risk it poses to wild tigers and other wildlife due to potential **disease transmission**. The court has suggested that the NTCA's **approach of considering tiger safaris as zoos within tiger reserves contradicts the core objectives of tiger conservation**.

But why build a tiger safari in a forest?

- The **construction of tiger safaris within forests** is **primarily** motivated by the **intent to mitigate the adverse effects of tourism on wildlife within tiger reserves**.
- **Safari parks offer these animals a chance to live in an environment that closely resembles their natural habitat**.
- The establishment of safari parks in buffer areas aligns with the **dual objectives of supporting the livelihood and developmental needs of local communities** while simultaneously **generating revenue and fostering positive attitudes towards tiger conservation**.
- **Challenges:**
 - Historical data indicates that **creating new safari routes** to manage tourism demand in tiger reserves often results in **increased tourist influx** rather than its intended reduction. The practice of showcasing "**rescued**" tigers in **safari parks** marks a departure from previous norms, which favoured **non-display facilities** for such animals.
 - Conservationists raise **ethical concerns**, arguing that the **concept of housing "rescued" wildlife in safari parks** prioritizes the welfare of individual animals over the broader interests of the species and conservation goals.

What is the ground reality in Corbett and elsewhere?

- The **Pakhrau Safari Park** planned on the southwestern edge of the **Corbett Tiger Reserve** near **Uttar Pradesh**, aims to avoid **disrupting tiger and wildlife movements** towards the **Rajaji tiger reserve** by utilizing an **existing forest road without necessitating tree cutting**.
- This **initiative** seeks to extend the **economic benefits of tiger tourism** beyond the **Ramnagar area**, which has so far capitalized on its proximity to **Corbett**, aiming to promote **livelihood and development opportunities** on the **reserve's other side**.
- However, parallels drawn with the **Ranthambhore safari park** in **Rajasthan**, intended for rescued tigers to alleviate tourism pressure and boost local livelihoods, suggest caution. Since its **conception in 2015-16**, the project has faced repeated setbacks, with attempts to construct peripheral walls collapsing and necessitating continuous repairs.
- Prior to the **Supreme Court's recent restriction on using zoo animals for such parks**, various safari parks within protected forests, like the **Nahargarh Biological Park** inaugurated in **2016**, have featured animals from zoos, including **Asiatic lions** and **Royal Bengal tigers**, among others.
- This practice, however, has proven problematic for territorial species, leading to stress and aggressive behaviour, as seen with **resident leopards** reacting to captive ones in **Nahargarh**, indicating the **complex dynamics** and challenges involved in **integrating safari parks within natural wildlife habitats**.

Bare act

Section: Environment Legislation and environment body

Context:

- **India's legislative and regulatory framework**, including the **Water (Prevention & Control of Pollution) Act of 1974** and the **Environmental (Protection) Act of 1986**, aims to **prevent the discharge of untreated industrial effluents into water bodies**.

Details:

- Despite these measures and the **Central Pollution Control Board's (CPCB) guidelines**, the effectiveness of these regulations remains unclear due to the lack of consolidated data on the generation and treatment of industrial effluents.
- A **2021 report** to the **National Green Tribunal (NGT)** reveals **fragmented data**, with significant gaps in information across various **states and Union Territories**.
- This incomplete picture hampers the understanding of **effluent management's actual state**, with large states like **Maharashtra, Tamil Nadu, and Uttar Pradesh** not providing comprehensive information.
- Regular inspections by **State Pollution Control Boards (SPCBs)** and **Pollution Control Committees (PCCs)** are **mandated**, yet the quality of these inspections and the enforcement of regulations are in question.
- Instances of **industries**, such as **Malbros International** in **Punjab**, **illegally discharging untreated effluents** highlight the challenges in **effectively monitoring** and **penalizing violations**.
- Efforts by the **NGT to upgrade laboratories and ensure compliance** have noted serious deficiencies in regulatory actions against waste management system violations.

Continuous effluent quality monitoring system (CEQMS):

- It is a **real-time air and water pollution monitoring system**.
- The introduction of the **continuous effluent quality monitoring system (CEQMS)** by **CPCB in 2014**, aimed at **enhancing transparency and compliance** through **real-time pollution monitoring**, has also faced issues with **widespread non-compliance** and data availability.
 - A **continuous monitoring system** is comprised of **sampling, conditioning, and analytical components** and **software designed to provide direct, real-time, continuous measurements of pollution** by **analyzing representative sample(s) of air and water** to be monitored.
 - It is an **important tool for better compliance enforcement** through **credible pollution monitoring and reporting practices**.
 - If installed properly, these systems can help to get accurate and real-time data at higher frequency with minimal manual intervention in order to strengthen the pollution control regime.
- As of 2023, data from many **SPCBs/PCCs** is either missing or inaccessible.
- Staff shortages significantly impact the **capability of pollution control boards to enforce environmental regulations effectively**, with a significant percentage of sanctioned posts remaining vacant.
- The **Water Pollution Act** and **related regulations** need updating to **improve transparency and data availability**.

- Unlike newer regulations for other types of waste, the current legal framework does not mandate the public availability of effluent data, further obscuring the situation and preventing informed action against water pollution.

Star-rating for state environment bodies not operational yet, Ministry tells NGT

Section: Environment law and body

Context:

- The Environment Ministry's plan to implement a star-rating system to evaluate states based on their efficiency in granting environmental clearances for industrial or infrastructure projects is yet to be launched.

Details:

- This update was provided to the National Green Tribunal's (NGT) Chennai bench, where the proposal is being challenged. The delay is due to ongoing efforts to upgrade and operationalize the website that would facilitate the ranking of State Environment Impact Assessment Authorities (SEIAAs).

About the Star-rating system:

- Introduced in January 2022.
- The star-rating system intends to rank SEIAAs based on their promptness in issuing environmental clearances, with points awarded on a scale of 0 to 7 based on the clearance time.
- The initiative is part of efforts to improve 'ease of doing business', following a Cabinet Secretary-led meeting in November 2021.
- SEIAAs issue clearances based on recommendations from Expert Appraisal Committees, which assess the environmental impact of proposed projects.

Arguments against the star-rating system:

- The star-rating system was challenged by Meenava Thanthai K R Selvaraj Kumar Meenavar Nala Sangam, a Tamil Nadu-based organization advocating for fishermen's rights.
- The challengers argue that the system could undermine the thoroughness of the environmental impact assessment process and contravene the Environment Impact Assessment (EIA) notification of 2006, which demands detailed scrutiny of project impacts.

Arguments in favour:

- The Ministry, in its defense, stated that the order is administrative, aimed at enhancing efficiency without altering the procedural or timeline requirements of the EIA notification of 2006.

What is Environmental Impact Assessment (EIA)?

- Defined by the UN Environment Programme (UNEP) as an analytical process that evaluates the potential environmental consequences of implementing a project.
- Aims to incorporate environmental considerations into decision-making processes for projects.

EIA in India:

- In India, the EIA process is mandatory for 39 categories of projects requiring an environmental clearance (EC).
- The EIA notification was first established in 1994 under the Environment (Protection) Act of 1986.
- This Act mandates environmental clearance for both the expansion and modernization of existing projects, as well as for the establishment of new projects.

Stages:

- The environmental clearance process comprises four stages, namely, Screening; Scoping; Public Consultation and Appraisal.
- The Expert Appraisal Committee (EAC) is a multi-disciplinary sectoral appraisal committee, whose primary role is to give recommendations to the MoEFCC on project proposals after considering the potential impacts of the project.
- Based on these recommendations, the MoEFCC either rejects the proposal or grants a clearance with conditions which would mitigate the impacts or compensate for the same.

Rules that Govern the EIA Process:

- To decentralize the process of project clearance, the EIA Notification 2006 has categorized the projects into Category 'A' and Category 'B' based on their impact potential.

International Big Cat Alliance headquarters will be in India; the Centre allocates Rs 150 crore

Section: Int Conventions

Context:

- The **Indian government** announced the establishment of the **International Big Cat Alliance (IBCA)** on February 29, 2024, following an idea proposed by Prime Minister Narendra Modi in **2019**.
- The **headquarters of IBCA** will be located in **India**.

Details:

- The Union Cabinet, led by Prime Minister Modi, approved a **one-time budgetary support of Rs 150 crore for IBCA**.
- This funding is allocated for a **five-year period from 2023-24 to 2027-28**.

Big Cats Overview:

- "**Big Cat**" refers to **large species within the Felidae family**, primarily those in the **Panthera genus**: Tiger (*Panthera tigris*), Lion (*Panthera leo*), Jaguar (*Panthera onca*), Leopard (*Panthera pardus*), Snow Leopard (*Panthera uncia*)
- These species are **capable of roaring**, with the **lion's roar being the loudest**, audible from 8-10 kilometres away.
- The **snow leopard** was initially classified as **Uncia uncia** but was later reclassified into **Panthera**.
- Although **not part of the Panthera genus**, **Puma (*Puma concolor*)** and **Cheetah (*Acinonyx jubatus*)** are commonly included in **big cat listings**.

Big Cats in the Indian Subcontinent:

- Historically, the region has been home to **several big cats: Bengal tiger, Asiatic lion, Indian leopard, Indian/Asiatic cheetah** (declared extinct in 1952), **Snow leopard**.
- In **2022**, the **Government of India** initiated a program to **reintroduce African cheetahs to Kuno National Park in Madhya Pradesh**, aiming to **revive the cheetah population** in the country.

About the International Big Cat Alliance (IBCA)

- **Formation and Purpose**
 - The **IBCA** is envisioned as a **coalition involving 96 big cat range countries, non-range countries interested in big cat conservation, conservation partners, scientific organizations, business groups, and corporates**.
 - The alliance **aims to establish networks, develop synergies, and create a centralized platform** for sharing successful conservation practices and resources.
 - Its **primary goal** is to **arrest the decline in big cat populations and reverse this trend through a multi-faceted approach**.
- **Strategies and Objectives**
 - The **IBCA** will focus on knowledge sharing, capacity building, networking, advocacy, financial and resource support, research, technical assistance, education, and awareness.
 - It seeks to **mitigate the adverse effects of climate change** and advocate for policy initiatives that **align biodiversity conservation** with local needs, contributing to the **United Nations Sustainable Development Goals**.
- **Organizational Structure**
 - The **IBCA's structure** will include an **Assembly of Members, a Standing Committee, and a Secretariat**, with headquarters based in **India**.
 - Its Framework of Agreement is modelled after the **International Solar Alliance**, another initiative proposed by **Prime Minister Modi in 2015**.
 - The **statute of the IBCA** will be finalized by an **International Steering Committee**, which includes **national focal points of founding member countries**.
 - An **interim head of the IBCA Secretariat** will be appointed by the **Ministry of Environment, Forest and Climate Change (MoEFCC)** until the IBCA appoints its **Director-General** during an Assembly meeting.
- **Funding and Support**
 - The Centre plans to seek **contributions** from **bilateral and multilateral agencies, public sector organizations, national and international financial institutions, and donor agencies** to support the **IBCA's initiatives**.

Planetary Boundary pioneer Johan Rockstrom wins 2024 Tyler Prize for environmental achievement

Section: Int conventions

Why in news?

The 2024 Tyler Prize for environmental achievement will be awarded to Johan Rockstrom for his groundbreaking contributions and pioneering work to the development of the Planetary Boundaries framework, the science for defining the safe operating space for humanity on Earth.

Who is Johan Rockstrom?

Rockstrom is director of the Potsdam Institute for Climate Impact Research (PIK) and co-chair of the Earth Commission. The framework provides boundaries for world development and a basis for human justice, PIK said in a statement on February 29, 2024.

The prestigious Tyler Prize is often described as Nobel Prize for environment. Rockstrom will receive the award on May 17, 2024, in a ceremony in Potsdam, Germany.

What is concept of planetary boundary?

The concept of planetary boundaries was first proposed by a team of international scientists in 2009 to articulate key natural processes that, when kept in balance, support biodiversity.

The Planetary Boundaries is an international collaboration across multiple Earth system science disciplines. The theory establishes defined boundaries for nine Earth systems, emphasising the critical importance of their stability and resilience in preserving life as we understand it.

Nine planetary boundaries beyond which we can't push Earth Systems without putting our societies at risk:

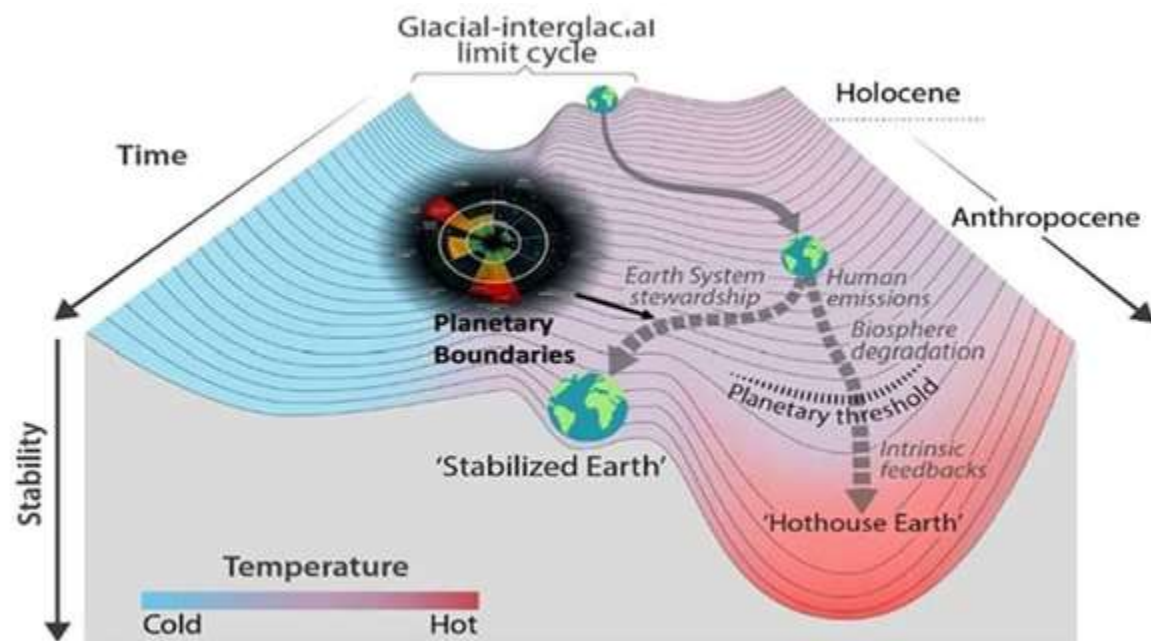
- climate change
- biodiversity loss
- ocean acidification
- ozone depletion
- atmospheric aerosol pollution
- freshwater use
- biogeochemical flows of nitrogen and phosphorus
- land-system change
- Release of novel chemicals.

Humanity already exists outside the safe operating space for at least four of the nine boundaries:

- climate change,
- biodiversity,
- land-system change, and
- biogeochemical flows (nitrogen and phosphorus imbalance).

The best way to prevent overshoot, researchers say, is to revamp our energy and food systems.

The nine planetary boundaries, counter clockwise from top: climate change, biosphere integrity (functional and genetic), land-system change, freshwater use, biogeochemical flows (nitrogen and phosphorus), ocean acidification, atmospheric aerosol pollution, stratospheric ozone depletion, and release of novel chemicals (including heavy metals, radioactive materials, plastics, and more).



- **Earth Trajectories:** Think of the Earth’s climate taking different trajectories through time — pathways weaving between different climate states.
- Different paths through all the possible climates can be influenced by distinct tipping points.
- Self-reinforcing feedback processes can lock the planet into a particular trajectory for centuries or millennia.
- There is no evidence that modern societies can exist, let alone thrive, in conditions substantially different from the Holocene.

Countries hope to bring BBNJ or High Seas treaty into force by 2025; only 2 have ratified it so far

Section: Int conventions

Context:

- The **Blue Leaders High-Level Event on Biodiversity Beyond National Jurisdiction** was held in **Belgium** on March 7, 2024, aiming to encourage nations to ratify a new treaty focused on protecting the high seas from threats like pollution, climate change, and overfishing.

Treaty Details:

- The **treaty for the conservation and sustainable use of marine biological diversity in areas beyond national jurisdiction (BBNJ Treaty)** was agreed upon in **March 2023** and formally adopted two months later.
- The treaty focuses on increasing protected marine areas, equitable sharing of profits from marine genetic resources, and establishing guidelines for Environmental Impact Assessments (EIA) for ocean activities.
- Countries such as **Belgium, Cape Verde, Greece, Monaco, Nigeria, Norway, and the UK** participated in the event.
- To date, **88 countries** have signed the treaty, with **Chile and Palau** being the **only two to have ratified it**.
- The treaty will officially come into force **once 60 countries ratify it**.
- **Goals and Challenges:**
 - The treaty aims to address the **lack of protection in the high seas**, which constitute over **two-thirds of the global ocean** yet have **only 1.44% designated as protected areas**.
 - It also aims to **ensure fair distribution of benefits from marine genetic resources** and to set protocols for environmental impact assessments of oceanic activities.
- **Implementation and Future Efforts:**
 - After **ratification**, significant efforts will be required to operationalize the treaty, including establishing **procedures, budgets, and deciding on the location for the Secretariat**, with **Belgium** offering to **host it in Brussels**.
 - Additionally, there is a **push to protect at least 30% of marine life by 2030**, a target that aligns with the “**Kunming-Montreal Global Biodiversity Framework**.”

- **Effective conservation and sustainable use of marine biodiversity** under the **BBNJ Treaty** will require **strong scientific support**.

What is the BBNJ Treaty?

- The “BBNJ Treaty”, also known as the “**Treaty of the High Seas**”, is an international agreement on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, **currently under negotiation at the United Nations**.
- The treaty will be **legally binding** in nature.
- This new instrument is **being developed within the framework of the UNCLOS**, the main international agreement governing human activities at sea.
- It will achieve a **more holistic management of high seas activities**, which should better balance the conservation and sustainable use of marine resources.
- **BBNJ encompasses the high seas, beyond the exclusive economic zones or national waters of countries**.
 - According to the **International Union for Conservation of Nature (IUCN)**, these areas account for “**almost half of the Earth’s surface**”.
 - These areas are **hardly regulated and also least understood or explored** for its biodiversity – only 1% of these areas are under protection.
- **An important element under the treaty: The benefit sharing of marine genetic resources (MGRs)**.
 - It includes marine plants, animals and microbes from areas beyond national jurisdiction.
 - The **element aims** to address the inequalities in sharing benefits from samples, basic and applied research results as well as monetary benefit sharing from MGRs.
- Launched at the **One Ocean Summit** in February 2022, the **High Ambition Coalition on Biodiversity Beyond National Jurisdiction** brings together many delegations engaged in the BBNJ negotiations on a common and ambitious outcome at the highest political level.
- The negotiations are **centred around a package of elements** agreed upon in 2015, namely:
 - the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, in particular, together and as a whole, marine genetic resources, including questions on the sharing of benefits
 - area-based management tools, including marine protected areas
 - environmental impact assessments
 - capacity-building and the transfer of marine technology

India's Stance and Global Concerns:

- **India has not signed the treaty** but expressed support for its implementation at the **G20 New Delhi Leaders’ Declaration** in September 2023.
- There are concerns about **potential delays in ratification**, reminiscent of the lengthy process for the **United Nations Convention on the Law of the Seas**.
- However, there's optimism due to strong political momentum and support for the treaty.

The problem of equity in IPCC reports

Section: Int Conventions

Context:

- In a study, researchers analysed **more than 500 future emissions scenarios** the **UN Intergovernmental Panel on Climate Change (IPCC)** assessed in its latest reports. These scenarios relate to **mitigation actions** like **reducing carbon dioxide emissions from burning fossil fuels** and **increasing carbon sequestration through forestry**.
- It found that **across all 556 scenarios, income, energy-use, and emissions disparities between developed and developing countries are projected to continue up to 2050**.

What are IPCC assessment reports?

- **IPCC reports** comprise **three Working Group reports**: one on **physical science**, one on **climate adaptation**, and one on **mitigation action**.
- **One synthesis report** consolidates findings from the **three Working Group reports**.
- Then there are **thematic special reports**.
 - Each report **assesses climate-related scientific literature** to capture the state of **scientific, technical, and socio-economic knowledge** on climate change.

- The IPCC is currently in its **Seventh Assessment cycle (AR7)**.

How does it assess future scenarios?

- IPCC employs "**modelled pathways**" created using **Integrated Assessment Models (IAMs)** to forecast how to limit Earth's surface warming.
- IAMs are sophisticated models **integrating various aspects** like **human and Earth systems, macroeconomics, energy consumption, land-use changes, and climate evolution** through physics laws.
- They **aim** to offer **policy-relevant advice for climate action** by examining potential future scenarios across different disciplines.
- Despite their comprehensive approach, IAMs have **limitations**, including a **focus on least-cost assessments**, which may **not account for equitable action burden sharing among countries**.
- **Critics** suggest that wealthier nations should adopt more immediate and significant mitigation efforts to distribute responsibilities fairly.

What did the new study find?

- The study analyzed **556 scenarios** from the **IPCC's AR6 report**, revealing **projected economic and environmental inequities** between the **Global North** and the **Global South**.
- They found that **per-capita GDP** in regions home to **60% of the world's population**, including **Sub-Saharan Africa, South Asia, and parts of Asia**, would **remain below the global average by 2050**.
- Additionally, the study highlighted **disparities in consumption of goods, services, energy, and fossil fuels**, with **developing countries** expected to rely more on **carbon sequestration from land-based sinks and carbon capture and storage (CCS)** technologies compared to **developed countries**.
- This implies that **poorer nations** would shoulder the **heavier burden of mitigation actions and carbon dioxide removal**.
- The authors criticize the scenarios for **overlooking the historical responsibility of the Global North** and the **future energy needs of the Global South for development**.

Why does equity matter?

- **Equity** is crucial in addressing **climate change** as it's **rooted in the principles of the UN Framework Convention on Climate Change (UNFCCC)**, specifically under **Article 3**, emphasizing "**common but differentiated responsibilities and respective capabilities**."
- This means while **global action is necessary to combat climate change**, wealthier countries should lead the efforts due to **their greater capacity and historical emissions**.
- Current mitigation pathways, often **developed** through **Integrated Assessment Models (IAMs)**, may not align with these **equity principles**, focusing instead on **global technical and economic feasibility** without adequately considering the distribution of responsibilities.
- The **principle of equity** suggests that **developed regions** should **aim for net negative emissions** to allocate the **remaining carbon budget to less developed regions**, supporting their **development goals**.
- However, current scenarios often depict the opposite, with **less developed regions bearing a larger share of mitigation actions and carbon dioxide removal**.
- The study highlights the **need for constructing IPCC scenarios** that are both **equitable and environmentally sound**, advocating for a shift towards modelling and scenario-building techniques that prioritize **equity and climate justice**, addressing this significant gap in emissions modelling.

IPEF: India to join US-led co-operative work programme on carbon market

Section: Int Conventions

Context:

- **India** has decided to **participate in at least one of the four cooperative work programmes** under the **US-led Indo-Pacific Economic Framework (IPEF)**, specifically focusing on **carbon market activities**.

Details:

- The **Ministry of Power** and the **Bureau of Energy Efficiency** will lead **India's involvement** in this programme.
- Additionally, **India** is considering **joining initiatives related to clean electricity and sustainable aviation fuel** but will make a final decision after a thorough evaluation.

Indo-Pacific Economic Framework (IPEF):

- Launched by **US President Joe Biden** in **May 2022**, the **IPEF** aims to **enhance regional cooperation** among **14 partners** in the **Indo-Pacific region**.
 - **The 14 members of the IPEF are-** Australia, Brunei, Fiji, India, Indonesia, Japan, South Korea, Malaysia, New Zealand, The Philippines, Singapore, Thailand, Vietnam, the USA
- The **IPEF is not a Free Trade Agreement(FTA)** but allows members to negotiate the parts they want to.
- The framework's **objectives** include **establishing common rules and standards across four pillars: digital trade connectivity, resilient supply chains, clean energy, and fair trade.**
- Notably, the **IPEF does not involve tariff cuts.**
- **India** has chosen to **participate in three pillars, excluding the trade pillar.**
- **India's Focus on Carbon Markets:**
 - **India** is **actively developing its carbon markets** and recently **amended its carbon credits trading scheme** to facilitate independent standards for carbon trading and **allow non-obligated entities to generate carbon credits.**
 - Through its participation in the **IPEF's carbon markets work programme, India aims** to learn from other countries' experiences and explore the potential for standardising and integrating carbon markets internationally.

India's involvement in other programmes:

- **India** is evaluating its **involvement in cooperative work programmes on clean electricity**, led by **Japan**, and **sustainable aviation fuel**, initiated by **Singapore**.
- Decisions on joining these programmes will consider their relevance to India's national interests.
- The work programme on '**just transition**' launched by **the Philippines** is also under consideration by many countries, focusing on workforce development.

Will global forest expansion hit tribals?

Section: Int Convention

Context:

- A **symposium** hosted by the **University of Arizona** focused on the **Conservation, Racism, and Indigenous Peoples Human Rights**, highlighting concerns regarding the **impact of the Kunming-Montreal Global Biodiversity Framework (GBF)** and the **Forest (Conservation) Amendment Act of 2023** on **India's tribes.**
- Participants warned that these measures, along with the **establishment of national parks**, could exacerbate **challenges for indigenous communities**, potentially leading to **detrimental consequences.**

Kunming-Montreal Global Biodiversity Framework (GBF):

- The **Kunming-Montreal Global Biodiversity Framework (GBF)** was established during the **15th meeting** of the **Conference of the Parties** to the **UN Convention on Biological Diversity (UN- CBD)** in **December 2022** after four years of consultations and negotiations.
- It aims to **guide the world towards living in harmony with nature by 2050, supporting sustainable development goals.**
- The framework sets **four goals for 2050** and **23 targets for 2030**, focusing on **planning, monitoring, finance, capacity development, and technical cooperation**, including **agreements on digital sequence information on genetic resources.**
- One **significant target (Target 3)** highlighted by rights activist **Suhas Chakma** seeks to **expand protected areas to cover at least 30% of the world's terrestrial area**, up from the **current 16%**, emphasizing **areas crucial for biodiversity and ecosystem functions.**

What are the implications?

- The **Symposium on Conservation, Racism, and Indigenous Peoples Human Rights** raised concerns that the **Kunming-Montreal Global Biodiversity Framework (GBF)** might **inadvertently prioritize corporate interests over the rights and well-being of indigenous communities.**
 - Examples include **indigenous peoples being denied basic rights (the right to housing, health, education, electricity, and security)** in **Indonesia's Ujungkulon National Park** and the **conviction of an indigenous leader in Cambodia under dubious legal circumstances for farming her land.**
 - Moreover, significant portions of **Cambodia's Botum Sakor National Park** have been **sold to private entities.**
- The **symposium** criticized **India's Forest (Conservation) Amendment Act of 2023** for **potentially allowing corporate exploitation under the guise of conservation** through activities like **zoos and ecotourism.**
- **Protected areas (PAs)** were **originally designed for the leisure of colonial elites**, a concept which has scarcely evolved, **reducing indigenous communities to mere exhibits in modern conservation efforts.**

What would GBF mean for India?

- The **implementation of the Kunming-Montreal Global Biodiversity Framework (GBF) in India** poses a significant threat to the **existence of indigenous communities**, with about **84%** of India's national parks established in areas inhabited by these communities.
- Activists highlight that meeting **GBF targets could lead to the displacement of indigenous peoples**.
- For example, upgrading the **Kumbhalgarh Wildlife Sanctuary to a tiger reserve would impact 162 tribal villages**, and **expanding the Nauradehi Sanctuary would affect 62 mostly tribal villages**.
- Additionally, the **creation of the Barak Bhuban Wildlife Sanctuary in Assam is controversial**, as despite **official records claiming the area is free of encroachments**, indigenous groups, like the **Khasis**, possess documents proving their long-standing residency since **1914**.

What can be done to protect the tribal lands?

- Need for the **recognition of the right to free, prior, and informed consent** as outlined in the **Panchayats (Extension to Scheduled Areas) Act 1996** and making **tribes the custodians of Protected Areas (PAs)**, **acknowledging their crucial role in conserving nature**.

Meghalaya's Byrnihat most polluted 'city' in India

Section: Pollution

Context:

- In February, **Byrnihat**, an **industrial town on the Meghalaya-Assam border**, was identified as **India's most polluted city** according to a **report by the Centre for Research on Energy and Clean Air (CREA)**.

Details of the report findings:

- This report, highlighting the **issue of air pollution in urban centres of the Northeast**—a region typically perceived as the **greenest part of India**—revealed **Byrnihat's PM2.5 levels to be significantly high**, with a **monthly average concentration of 183 µg/m³**.
- This level not only **surpassed that of Bihar's Araria, the second-most polluted city**, by approximately **60 µg/m³** but was also nearly **1.8 times higher than the PM2.5 concentration in Delhi**, ranked as the **14th most polluted city** for the same month.
- The findings also placed other **northeastern urban centers**—**Nalbari (5th)**, **Agartala (12th)**, **Guwahati (19th)**, and **Nagaon (28th)**—among the **top 30 most polluted cities in India** for February.
- This suggests a concerning trend of escalating pollution levels across the region. Furthermore, **out of 11 cities in the northeastern states** with continuous ambient air quality monitoring stations, **six exceeded the daily National Ambient Air Quality Standards (NAAQS)** prescribed by the **Central Pollution Control Board** for **PM2.5 levels**, indicating a pressing environmental challenge in these areas.

Cleanest cities:

- Conversely, cities like **Sivasagar, Silchar, Aizawl, and Imphal** in the **northeast** recorded **PM2.5 concentrations below the National Ambient Air Quality Standards (NAAQS)**, marking them as the **cleanest in the region**.
- However, **none of these cities met the World Health Organization's (WHO) safe guideline concentrations for PM2.5**.
- This situation underscores the urgent need for **enhanced air quality monitoring and management**, especially given the environmental degradation attributed to unregulated industrial activities, insufficient public transportation, and poor construction practices among other factors.
- The report also noted an **overall improvement in air quality across India in February**, with an **increase in cities** classified under the **'good'** and **'satisfactory'** categories and a **decrease** in those categorized as **'moderate,' 'poor,' and 'very poor.'**
- This improvement was attributed to **better wind speeds, rising temperatures, and possibly reduced emissions**, reflecting a positive trend in efforts to tackle air pollution.

Centre for Research on Energy and Clean Air (CREA):

- CREA is an **independent research organisation** focused on revealing the trends, causes, and health impacts, as well as the solutions to air pollution.
- They use scientific data, research and evidence to support the efforts of governments, companies and campaigning organisations worldwide in their efforts to move towards clean energy and clean air. They believe that effective research and communication are the key to successful policies, investment decisions and advocacy efforts.
- Registered as a **nonprofit in Finland**, with **staff across Asia and Europe**.

- Their work is **funded** through **philanthropic grants** and **revenue from commissioned research**.

Higher levels of heavy metals in areas around the Bhopal gas tragedy site: Government report

Section: Pollution

Context:

- Nearly four decades after the **Bhopal gas tragedy**, a report submitted to the **National Green Tribunal (NGT)** by the **Central Ground Water Authority (CGWA)** reveals **heightened levels of heavy metals** in **groundwater** near the **defunct Union Carbide India Limited (UCIL) plant in Bhopal**.

Details:

- Key findings from the **CGWA's** report include **minimal zinc contamination**, with only one location surpassing the **Bureau of Indian Standards (BIS) acceptable limit**, while **arsenic levels** were **generally within safe limits**, barring one exception. **Manganese pollution** was noted in **8.33%** of the **sampled locations**, particularly in deeper aquifers.
- The report also identified **strontium concentrations**, unregulated by **BIS**, within a significant range across sampled sites.
- Critics argue that the **CGWA study** inadequately addresses the full scope of contamination, **neglecting pesticides, organochlorines, and other persistent organic pollutants** previously **detected in groundwater studies**.
- Historical and ongoing research underscores the gravity of groundwater contamination outside the **UCIL factory area**, linking it to potential cancer risks and other health issues.
- The **persistence of toxic waste on-site** raises concerns over **further contamination spread**, as highlighted in a **2018** affidavit by an **Indian Institute of Technology (IIT)-Madras** professor to the Supreme Court, noting the presence of toxic chemicals known to cause significant health damage.

Bhopal Gas Leak:

- The **Bhopal Gas Tragedy**, also known as the **Bhopal disaster**, occurred on **December 3, 1984**, when **methyl isocyanate gas** leaked from a **pesticide plant** owned by **Union Carbide India Limited in Bhopal, India**.
- It is considered one of the world's worst industrial disasters.

Bihar's Begusarai, 'world's most polluted city in 2023'; India ranks 3rd globally: Swiss report

Section: Pollution

The World Air Quality Report 2023:

- The report, produced by the **Swiss organization IQAir**, marks its **6th** annual publication, offering insights into **global air pollution levels**.
- It emphasizes the need for local, national, and international efforts to address air quality issues, manage transboundary haze, and reduce reliance on combustion energy sources.
- **Key Findings:**
 - **Begusarai in Bihar** was named the **most polluted metropolitan area in 2023**.
 - **Delhi** was recognized as the **capital city with the poorest air quality globally**.
 - **India** ranked as the **third worst country** out of **134** in terms of **average annual PM2.5 concentration**, following **Bangladesh (1st)** and **Pakistan (2nd)**.
- **India's Air Quality:**
 - Approximately **96%** of **India's population** lives in areas where air quality is **seven times worse than WHO guidelines**.
- **Global Air Pollution status:**
 - About **92.5%** of the **7,812 locations** analyzed across **134 countries** exceeded **WHO's PM2.5 air quality guidelines**.
 - **Columbus, Ohio, and Beloit in Wisconsin**, were highlighted as **polluted cities in the United States**, with **Las Vegas** being the **cleanest major US city**.
 - **Africa** is significantly **underrepresented in air quality data**, lacking information for a third of its population.
 - **Canada** was identified for the **first time** as the **most polluted country in Northern America**.
 - **Seven countries** (Australia, Estonia, Finland, Grenada, Iceland, Mauritius, and New Zealand) **met the WHO's PM2.5 annual guideline**.

About PM2.5:

- **PM2.5** refers to **particulate matter** that is **2.5 microns in diameter**, posing significant **health risks** such as **heart attacks, strokes, and oxidative stress** even at modest concentrations.

- The WHO revised its **PM2.5 guideline** to recommend a **yearly average of 5 µg/m³ or less**, tightening from the previous guideline of 10 µg/m³.

Ministry of Environment tightens rules on bioplastics

Section: Pollution

Context:

- The **Environment Ministry** has introduced **stricter regulations** for **labelling disposable plasticware** as **'biodegradable'**.

Details:

- Products must meet the **new standard of leaving no microplastics behind** to be considered **biodegradable**.
- There are **two main technological solutions** to **tackle plastic waste pollution**: **biodegradable** and **compostable plastics**.
 - **Biodegradable plastics** are **treated before sale**, aiming for **natural decomposition**, but there's a lack of tests to confirm complete degradation.
 - **Compostable plastics** can **degrade** but **require industrial or large municipal waste management facilities**.

Microplastics:

- **Microplastics**, defined as **solid plastic particles insoluble in water** and ranging from **1 µm to 1,000 µm in size**, have emerged as a **significant pollutant in rivers and oceans**.
- With the **ban on single-use plastic in 2022**, there has been a heightened focus on **biodegradable plastics** as an **alternative**.

Plastic Waste Management (Amendment) Rules, 2024: Key points

- Defines **biodegradable plastics** as those that can **degrade biologically in environments** like **soil or landfill without leaving behind microplastics**.
- The **amendments lack specific guidance** on **chemical tests** for **establishing the absence of microplastics** or the **required reduction level to deem microplastics eliminated**.
- The amendment provides that the **manufacture of carry bags and commodities** shall be **permitted to be made** from **compostable plastics** or **biodegradable plastics**.
- This is subject to **mandatory marking and labelling** laid down under the **rules and regulations of the Food Safety and Standards Authority of India (FSSAI)** for **food contact applications**.
- The **rules** require the **manufacturers of compostable plastic or biodegradable plastic carry bags or commodities** to obtain a **certificate** from the **CPCB** before marketing or selling.
- **Every manufacturer of commodities made from plastic shall-**
 - Ensure processing of the **pre-consumer plastic waste** generated in the form of rejected or discarded material at the stage of manufacturing and
 - Report to the **State Pollution Control Board** or **Pollution Control Committee** concerned.

Issues with the amended rules:

- The **exact definition** of **biodegradable plastic** remained unclear, leaving several firms, including those utilizing technologies like Symphony's, without clarity.
- The **Central Pollution Control Board (CPCB)** has faced **criticism** for not issuing **'provisional certificates'** for **biodegradable products**, as their **criteria require 90% degradation over two years**, with **no specific guidelines for interim assessment**.
- **Manufacturers** showing **partial degradation**, such as **5% in 45 days**, were **denied certification due to this lack of clarity in the rules**.

Rules on Plastic Waste Management so far:

- **Plastic-waste management rules, 1999**: Its aim was to restrict the use of plastic carry bags (thickness 20 µm or less) and prevent food from being packaged in recycled plastic.
- **Plastic Waste Management (Amendment) Rules, 2003**: It diluted the restriction on carry bags but mandated registration of manufacturing units with regional pollution control authorities.
- **Plastic Waste Management (Amendment) Rules, 2011**: For the first time, there was a national law proposing a ban on the use of plastic materials in sachets to store, pack or sell gutkha, tobacco, and pan masala.
- **Plastic Waste Management (PWM) Rules, 2016**: It included many progressive propositions, like **'polluter pays'** and **'extended producer responsibility'**.

- **Plastic Waste Management (Amendment) Rules, 2021:** The rules aim to prohibit the use of specific single-use plastic items, which have “low utility and high littering potential” by 2022.

Over 24,000 birds from 66 species recorded during Tamirabharani Waterbird Count

Section: Protected Areas

Context:

- The **Tamirabharani Waterbird Count 2024** organised recently has recorded over **24,000 birds** in the **irrigation tanks getting water from the perennial river**.

Details:

- **World Wildlife Day** on **March 3**.
- **ATREE’s Agasthyamalai Community Conservation Centre (ACCC)** initiated the citizen-centric bird monitoring program, the **Tamirabharani Waterbird Count**, in **2011**.
- The **14th** edition of the **Tamirabharani Waterbird Count** is co-organized by **ATREE’s ACCC**, Pearl City Nature Trust, Thoothukudi, Nellai Nature Club Trust, Tirunelveli, and Pushpalata Educational Centre, Tirunelveli.
- **40 out of 100** are identified as migratory birds.
- **Sighted birds: Black-tailed Godwit, Egret species** (Cattle Egret, Little Egret, Medium Egret and Large Egret), **Migratory duck species** (Northern Pintail, Bar-headed Geese, and Eurasian Wigeon), **Cormorant species** (Little Cormorant, Indian Shag, and Oriental Darter), Spot-billed Duck, Common Coot
- **Tamirabharani** and its **major tributaries**, including **Chithar, Pachchaiyar, Gadana, and Ramanathi** serve as crucial water sources for the districts of **Tirunelveli, Tenkasi and Thoothukudi**.
- Beyond natural disasters, **man-made threats** such as sewage water drainage, improper waste disposal and misuse of tanks for anti-social activities, mostly for consuming liquor, were observed in numerous tanks.
 - The **Vaeinthankulam tank**, located in the heart of the city of **Tirunelveli** faces **severe degradation** due to anti-social activities including daytime liquor consumption on the tank bund and using this spot for flesh trade in the dusk.
 - The **Veinthankulam restoration project** was initiated under the ‘**Nellai Neervalam**‘ in June 2021, and subsequently joined by **Care Earth**.

About the Tamirabarani River:

- Tamirabarani is the **only perennial river** in south India that flows through the districts of **Tirunelveli and Thoothukudi** in **Tamil Nadu**.
- **Originating** from the **Pothigai hills of Western Ghats**, the life-giving river dribbles, sprints and gallops for about **128 kilometres** along the southern edge of the country.
- It originates and ends in the same state (Tamil Nadu).
- The river is deeply connected to the lives, livelihoods and culture of the people in the state.
- The river supports wildlife such as the **Nilgiri marten, slender loris, lion-tailed macaque, white spotted bush frog, galaxy frog, Sri Lankan Atlas moth and the great hornbill**.

Trees in Corbett fell prey to greedy nexus, says Supreme Court

Section: Protected Areas

Context:

- The Supreme Court criticized the **illegal cutting down of over 6,000 trees** for the construction of buildings under the guise of “**eco-tourism**” at **Jim Corbett National Park, Uttarakhand**, highlighting it as an example of the **detrimental collaboration** between politicians and officials for commercial benefits at the expense of the environment. This act was particularly condemned as it severely impacted the **Corbett Tiger Reserve, a critical habitat for tigers**.

Details:

- The court directed the **Ministry of Environment, Forest and Climate Change** to establish a **specialized committee** to evaluate and provide recommendations on the allowance of **tiger safaris** in the **buffer zones of tiger reserves**.
- The court emphasized **Uttarakhand's obligation to restore the forest fully and underscored the intrinsic connection** between **tigers and their forest habitat**, indicating the **critical role of tigers in maintaining the ecosystem's health**.
- The **specialized committee** is to include members from the **National Tiger Conservation Authority, Wildlife Institute of India, Central Empowered Committee**, and a **Joint Secretary** from the **Ministry**, focusing on ensuring the protection of tigers and, by extension, the ecosystem surrounding them.

Panel to access damage:

- The appointed panel is tasked with **evaluating the damage to the green cover of the Corbett Reserve**, estimating the **restoration costs**, and identifying the individuals and officials responsible for the damage.

Guidelines for safaris:

- The **Supreme Court** indicated that if the **committee** recommends **permitting tiger safaris** in the **peripheral areas of tiger reserves**, it should also **propose guidelines for their operation, applicable across India**.
- The court emphasized an **eco-centric approach to tiger safaris**, criticizing the **use of tigers from zoos** for these purposes as suggested by the **2019 National Tiger Conservation Authority (NTCA) guidelines**.
- Instead, it referred to the **2016 NTCA guidelines**, which **advocate for using only injured, conflict, or orphaned tigers** unfit for rewilding, sourced from the same landscape as the safari.
- The court **rejected** the idea of **selecting safari animals with the Central Zoo Authority's approval** and **opposed** the creation of a "**Master Plan**" by the **CZA** for **managing tiger safaris**.
- It stressed **minimizing environmental damage**, suggesting that any resorts should be built to blend with the **natural environment, noise levels should be controlled, and safaris should be close to animal rescue centres**.
- Existing safaris, like the **Pakhro zone** in **Corbett**, are to remain undisturbed, but the court instructed the Uttarakhand government to set up an animal rescue centre nearby.

Jim Corbett National Park:

- **Jim Corbett National Park** is the **oldest national park** in India and was established in **1936** as **Hailey National Park** to protect the **endangered Bengal tiger**.
- It is located in **Nainital district** and **Pauri Garhwal district** of **Uttarakhand** and was named after **hunter and naturalist Jim Corbett**.
- The Park was the first to come under the **Project Tiger initiative**.
- The Park encompasses the **Patli Dun valley** formed by the **Ramganga river**.
- **Ramganga, Sonanadi, Mandal, Palain** and **Kosi** are the **major rivers** flowing through the **Corbett National Park**.
- The national park is a protected area covered by the **World Wide Fund (WWF) for Nature** under their **Terai Arc Landscape Program**.

Supreme Court stops Assam's move to withdraw notification of Pobitora Wildlife Sanctuary

Section: Protected Areas in news

Context:

- The **Supreme Court** halted the **Assam government's attempt to withdraw a notification from March 17, 1998**, that established the **Pobitora wildlife sanctuary**, a crucial habitat for one of the largest rhino populations in India.

Concerns Over Sanctuary Declaration:

- The government highlighted that the **sanctuary's declaration overlooked the rights of villagers from marginalized communities** in **Thengabhangra, Murkata, and Mayong**, who have lived in the area since before India's independence.
- Following the **withdrawal of the 1998 notification**, the government formed a **committee to assess the rights and claims of forest dwellers** and to **reconsider the declaration of the Pobitora region as a wildlife sanctuary**.
- **Justice B.R. Gavai** emphasized that **withdrawing a notification declaring a wildlife sanctuary requires approval from the National Board of Wildlife** and noted previous orders against the **dereservation of protected areas**. The Court found the withdrawal "**ex facie illegal**."
- Assam's counsel argued that the **withdrawal aimed to correct a past error in land demarcation, not to dismantle the sanctuary**.
- The justices affirmed the government's responsibility towards both the sanctuary and the rights of forest dwellers.

Pobitora Wildlife Sanctuary:

- **Pobitora Wildlife Sanctuary** is situated in the **flood plains of River Brahmaputra** in the district of **Morigaon** in the state of **Assam**.
- It harbours the **highest density of Rhino in the world** and the **second highest concentration of Rhino** in **Assam** after **Kaziranga National Park**.
- It is often called '**Mini Kaziranga**' because of the **similar landscape** and the **sizeable population of the one-horned rhino**.
- **Fauna:** Leopard, Leopard cat, Fishing cat, Jungle cat, Feral Buffalo, Wild pigs, Chinese pangolins, etc.

- **Flora:** Its maximum consists of the wet savannah of *Arundo donax* and *Saccharum*. The remaining area is covered by water bodies.

Ready proposal to demarcate Dulung-Subansiri elephant corridor, Union environment ministry tells Arunachal, Assam

Section: Protected Area

Context:

- The wildlife division of the **Union Ministry of Environment, Forest and Climate Change (MoEFCC)** recently directed the forest departments of Arunachal Pradesh and Assam to prepare a proposal to notify the **Dulung-Subansiri elephant corridor**.

More on news:

- The corridor will facilitate the **east-west movement of elephants across the Subansiri River**.

About Elephant Corridors:

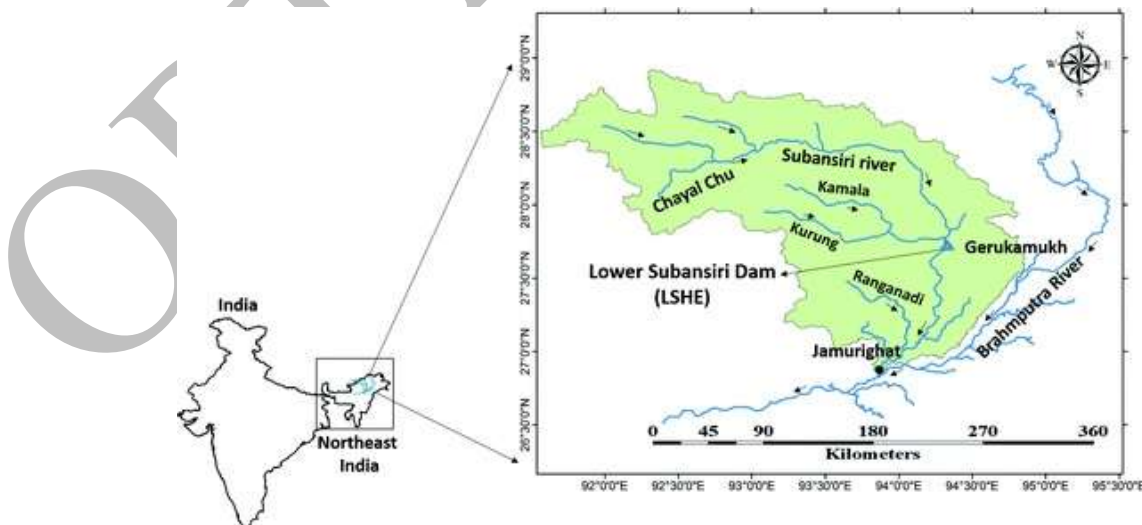
- Elephant corridors are **linear, narrow, natural habitat linkages that allow elephants to move between secure habitats without being disturbed by humans**.
- They help animal movement and enable genetic exchange which in turn helps in sustaining the elephant population.
- The number of elephant corridors have increased to 150 against 88 registered by the Government of India in 2010.
- **West Bengal has the most elephant corridors i.e. 26, amounting to 17 per cent of the total corridors.**
- The **East central region contributed to 35 per cent** (that is 52 corridors) while the **North East region was second largest with 32 percent** (48 corridors in total).
- **International Union for Conservation of Nature (IUCN) Red List of threatened species:**
 - African Forest Elephant Critically Endangered.
 - African Savanna Elephant- Endangered.
 - Asian Elephant- Endangered.
- Elephants come under **Schedule I of The Wildlife Protection Act,1972**.

About Lower Subansiri hydro-project:

- The **2000 MW Lower Subansiri hydro-project**, executed by the National Hydroelectric Power Corporation (NHPC), is located in the **Kamle and Dhemaji districts of Arunachal Pradesh and Assam, respectively**.
- It is being constructed on the **Subansiri River, a tributary of the Brahmaputra River**.

About Subansiri River:

- It is a **trans-Himalayan River** and a tributary of the Brahmaputra River that flows through **Tibet's Lhuntse County** in the Shannan Prefecture, and the Indian states of Arunachal Pradesh and Assam.
- It is the **largest tributary of the Brahmaputra** contributing 7.92% of the Brahmaputra's total flow.
- Small tributaries of the Subansiri include **Ranganadi, Dikrong and Kamle**.



Areas in news:

Dulung: Assam

Subansiri: Arunachal Pradesh

What Is Kuttanad Farming?

Section: Protected Area

Concept:

What is Kuttanad Wetland Agriculture System?

- **Kuttanad Wetland Agriculture System** is unique, as it is the only system in India that **favours rice cultivation below sea level** in the land created by draining delta swamps in brackish waters. As an approach to cope with the imminent climate impacts in coastal areas and evolve efficient methods it aims to deal with soil availability and floods issues in agriculture.

More details:

- There are only two regions in the world where paddy is cultivated below the mean sea level. These places are in **Holland and Kerala's Kuttanad**. It has been an age-old practice for the farmers of Kuttanad as the region lies two to three feet below the sea level. Kuttanad largely spans through three districts — **Alappuzha, Kottayam and Pathanamthitta**. While 65 per cent of the sub-sea-level farming is done in Alappuzha district, 30 per cent is done in Kottayam district and 5 per cent in Pathanamthitta district.
- This region of the Alappuzha district in Kerala lies more than two metres below sea level and has the lowest altitude in India. It is serviced by the state's significant rivers Pampa, Meenachil, Achan Kovil and Manimala in addition to **Vembanad-Kol wetland**, India's second-largest wetland ecosystem. Luxury houseboats occupy the lake and several canals link it with the rivers, while numerous cottages and eateries dot the islands.
- The Kuttanad area of Kerala was declared by **FAO as a GIAHS (Globally important Agricultural Heritage System)** on the basis of a proposal prepared by **M.S. Swaminathan Research Foundation MSSRF**. Kuttanad is also a Ramsar site and a reputed destination for water tourism. Over the years, the Kuttanad ecosystem has deteriorated considerably due to human interventions, flooding and other ecological disasters.
- The Kuttanad system is a complex mosaic of fragmented agricultural landscapes divided in three structures: **wetlands used for paddy activities and fish catching, garden lands used for coconut, tubers and food crops plantation and water areas used as inland fishing and shells. Wetlands are created thanks to the construction of polders with bunds and its dewatering.**

Challenges:

- Facing a severe pollution of waters due to the tourism
- Use of chemicals

Vembanad

- Vembanad, also known as Punnamada is the **longest lake in India**, as well as the **largest lake in the state of Kerala**.
- It is the **second largest Ramsar site in India** only after the Sunderbans in West Bengal.
- Spanning several districts in the state of Kerala, it is known as **Vembanadu Lake** in Kottayam, Vaikom, Changanassery, **Punnamada Lake** in Alappuzha, Punnappra, Kuttanadu and **Kochi Lake** in Kochi.
- **Kuttanad**, also known as The Rice Bowl of Kerala, has the lowest altitude in India, and is also one of the few places in world where cultivation takes place below sea level. Kuttanad lies on the southern portion of Vembanad.
- The **Nehru Trophy Boat Race** is conducted in a portion of the lake.
- The lake has its source in four rivers, Meenachil, Achankovil, Pampa and Manimala.
- It is separated from the Arabian Sea by a narrow barrier island and is a popular backwater stretch in Kerala.
- The Government of India has identified the Vembanad wetland under the **National Wetlands Conservation Programme**.
- In 2019, **Willingdon Island**, a seaport located in the city of Kochi, was carved out of Vembanad Lake.
- One of the most outstanding features of this lake is the 1252 m long **saltwater barrier, Thanneermukkom**, which was built to stop saltwater intrusion into Kuttanad.

ZSI names a newly discovered sea slug after President Murmu

Section: Species in news

Context:

- The **Zoological Survey of India (ZSI)** discovered a **new species** of **head-shield sea slug** with a **distinctive ruby red spot**.
- Found along the **West Bengal (Digha)** and **Odisha (Udaipur)** coasts.
- Named **Melanochlamys droupadi** in honour of the **President of India, Droupadi Murmu**.

Species Characteristics:

- Belongs to the **Melanochlamys genus**, notable for short, blunt, cylindrical body and smooth dorsal surface with two dorsal shields: **anterior cephalic** and **posterior**.
- **Unique features of Melanochlamys droupadi:**
 - The maximum length of 7 mm, **Brownish-black colour** with a **ruby red spot** at the **hind end**, **Hermaphroditic**, with a **shell inside the body**, and Typically found **crawling** in the **intertidal zone**, leaving crawl marks on sandy beaches.

Reproduction and Habitat:

- The reproduction period is between November and January.
- Located near **Hospital Ghat, Old Digha**, only 50 meters away from **ZSI's Marine Aquarium Regional Centre**,

Conservation and Study:

- Type specimens are deposited in the **Marine Aquarium and Regional Centre, Digha**, and **Estuarine Biology and Regional Centre, Gopalpur**.
- The species exhibits behaviour like **secreting transparent mucus for protection against sand grains** and **moving beneath smooth sand**, rarely exposing its body.

Distribution and Significance:

- Melanochlamys species are generally found in **temperate regions** of the **Indo-Pacific Oceanic realm**, with **three species**, including **Melanochlamys droupadi**, being **truly tropical**.
- Other **tropical species** include **Melanochlamys papillata** from the **Gulf of Thailand** and **Melanochlamys bengalensis** from the **West Bengal** and **Odisha** coasts.
- Their research highlights the **unique adaptation mechanisms** of **Melanochlamys droupadi**, contributing to the understanding of **marine biodiversity in the region**.

About Sea Slug:

- Sea slug is a common name for some **marine invertebrates** with **varying levels of resemblance to terrestrial slugs**.
- The name "**sea slug**" is often applied to **nudibranchs** and a **paraphyletic set** of other **marine gastropods** without apparent shells.

[India's leopard population rises to 13,874; M.P. on top](#)

Section: Species in news

In the news:

- **India's leopard population increased** by **8%** from **12,852** in **2018** to **13,874** in **2022**, as reported by the Environment Ministry.
- The exercise to estimate the **population of leopards in India** is in its **fifth cycle (2022)**.
- The **National Tiger Conservation Authority** and **Wildlife Institute of India**, in collaboration with **state forest departments**, focused on **forested habitats within 18 tiger-range states**, covering **four major tiger conservation landscapes**.

Details:

- The **highest leopard count** was in **Madhya Pradesh (3,907)**, followed by significant populations in **Maharashtra (1,985)**, **Karnataka (1,879)**, and **Tamil Nadu (1,070)**.
- However, **Uttarakhand** experienced a **22% decline** in leopard numbers due to **poaching** and **human-leopard conflicts**.
- On a positive note, **Arunachal Pradesh**, **Assam**, and **West Bengal** collectively saw a **150% increase** in leopard numbers, reaching **349 animals**.
- **Nagarajunasagar Srisailam** in **Andhra Pradesh**, **Panna** and **Satpura** in **Madhya Pradesh** were the **tiger reserves** with the **highest numbers of leopards**.
- The survey, which covered **20 States**, focused on approximately **70%** of the **leopard's expected habitat**, including **tiger reserves** and **protected forest areas**.
- Unlike **tigers**, **leopards** are **more adaptable**, often found in **villages and cities**, leading to **conflicts with humans** due to their tendency to prey on cattle.

Habitat conservation:

- The report, authored by **Qamar Qureshi** of the **Wildlife Institute of India**, highlights that **a third of India's leopards reside within protected areas**, emphasizing that **conserving tiger reserves** also benefits **leopard habitats**.
- The study focused on forest regions surveyed in **2018**, showing varied growth rates across different geographical areas: a **3.4% annual decline in the Shivalik hills** and **the Gangetic plains**, while **Central India** and **the Eastern Ghats, the Western Ghats** along with the **hills of the northeast**, and the **Brahmaputra flood plains** experienced **growth rates of 1.5%, 1%, and 1.3% per year**, respectively.
- The report suggests a **stable leopard population** over the last four years but with **minimal growth**, indicating possible impacts from human activities in multiple-use areas.
- Significant findings include a **decline in leopard numbers** in the **Ramnagar forest division (Uttarakhand)** amidst a **sharp increase in tiger populations**.
- Remarkably, **65% of leopards live outside protected areas** in the **Shivalik landscape**, though both **leopard and tiger populations** have **grown in Uttar Pradesh**.
- The notable **increase in leopard numbers** in the **northeastern states** was attributed to a "**sampling artefact**", pointing out the lack of systematic surveys and fewer cameras in previous years.

Mating calls indicate endangered Hanguls are on a comeback trail

Section: Species in news

Context:

- **Kashmir's hangul**, a **critically endangered species** of **deer** known for its **shyness** and **sensitivity**, experienced one of its healthiest mating seasons in the previous autumn, **indicating a possible increase in population**.

Details:

- The **hangul population** could surpass **300** this spring, marking the first time in over 30 years.
- The **current male-to-female ratio** stands at **19.2 males per 100 females**, which is significantly **lower than the ideal**.

About Hangul:

- **Hangul**, also known as the **Kashmir stag**, is a species of **deer native to the state of Jammu and Kashmir in India**.
- **Scientific Name:** Hangul is scientifically known as **Cervus hanglu**.
- **Hangul** primarily inhabits the **dense temperate forests of the Kashmir Valley** and its surrounding areas. It is found at elevations ranging from **1,700 meters to 3,000 meters** above sea level.

Challenges:

- Challenges such as **habitat disturbance** and **human intervention** have impacted **hanguls**, but **improved environmental conditions** and **protective measures**, including **traffic regulation** in **Ganderbal** for **safe hangul movement**, are being implemented.
- The Wildlife Department has identified **threats** such as **water scarcity**, leading to **hanguls venturing into disturbed habitats**, increasing the risk of predation.

Conservation efforts:

- During the **rutting season** in October, the **Dachigam National Park**, where **hanguls** reside, was temporarily closed.
- The **hangul**, recognized as the **State animal of Jammu & Kashmir (J&K)**, has seen its **numbers decline sharply since 1947**, from around **2,000** to as low as **183 in 2015**.
- However, recent efforts have led to a **steady increase**, with the population estimated at **261 in 2021**.
- To support **hangul conservation**, **10 sites** have been earmarked for protection, and a **captive-breeding facility** has been established at **Shikargah Tral**.

Children fall to hunger in Gaza as Israeli siege cuts off supplies- 'khubaiza.'

Section: Species in news

Context: After months of warnings over the risk of famine in Gaza under Israel's bombardment, offensives and siege, children are starting to die

Khubaiza: weed that crops up in empty lots.

7396 golden langurs in India, reveals survey

Section: Species in news

Context:

- A recent survey conducted by a collaboration of **wildlife research and conservation organizations**, including the **Primate Research Centre NE India (PRCNE)**, **Assam Forest Department**, **Bodoland Territorial Council**, **Salim Ali Centre for Ornithology and Natural History (SACON)**, and **Conservation Himalayas**, has estimated the population of **golden langurs in India at 7,396 individuals**.

Details:

- This **endangered primate, Trachypithecus geei**, is found exclusively in the **Manas Biosphere Reserve** and **fragmented forests in western Assam**.
- The survey was conducted in **two phases**, first covering the **western part of the Manas Biosphere Reserve**, including the newly upgraded **Raimona National Park** and several reserve forests, and then focusing on **fragmented habitats in Bongaigaon, Kokrajhar, and Dhubri districts**. Utilizing the **block count method** for the first time for **golden langurs**, the habitat was divided into 51 blocks, surveyed by teams of trained enumerators and forest staff.
- The survey identified **7,720 individuals in 706 groups and 31 lone or floating males**, leading to an estimated minimum population of **7,396 in 707 groups**, including both **bisexual and male bands**, along with **lone males**.
- The population is divided into **two major sub-populations**: a northern extended population in the **Manas Biosphere Reserve**, estimated at **5,566 individuals in 534 groups**, and a **southern fragmented population** estimated at **1,830 langurs in 173 groups**.

Golden langur:

- **Gee's golden langur (Trachypithecus geei)**, also known as simply the **golden langur**, is an **Old World monkey** found in a **small region of Western Assam, India** and in the neighbouring foothills of the **Black Mountains of Bhutan**.
- Long considered sacred by many Himalayan people.
- Adult males have a cream to golden coat with darker flanks while the females and juveniles are lighter.
- It **lives in high trees** and has a **herbivorous diet of fruits, leaves, seeds, buds and flowers**
- It is **one of the most endangered primate species of India and Bhutan**.
- In **2008-09**, there were **6,000 golden langurs in India**, which has grown to **7,396 in 2020-21**.
- **IUCN Red List**: Endangered
- **CITES**: Appendix-I

Unstable situation:

- The latest population estimation reveals that the **Ripu Reserve Forest** hosts the **largest northern population of golden langurs with 2,847 individuals**, while the **Chakrashila Wildlife Sanctuary** in the **Kokrajhar** district harbours the most in the **southern fragmented range with 838 langurs**.
- Despite this **population growth**, the survey report signals an **unstable situation in the golden langurs' fragmented habitats**, primarily due to the **absence of non-breeding all-male bands**.
- To mitigate the challenges posed by this fragmentation and the ensuing **anthropogenic threats**, the primatologists recommend the creation of corridor linkages among these habitats.
- These corridors, potentially established through plantations and canopy bridges, aim to facilitate safer movement for the langurs across their disjointed habitats.

Centre contemplating a ban on wolf dogs. But what about the hybrids roaming India's wilds?

Section: Species in news

Context:

- The **Department of Animal Husbandry and Dairying** has requested local bodies to **avoid issuing licenses for the sale and breeding of certain dog breeds** considered '**ferocious**' and '**dangerous for human life**', including **wolf-dog hybrids**.

Wolf-Dog Hybrids:

- **Wolf-dog hybrids** result from **breeding wolves with certain domestic dog breeds** like **Akitas, German Shepherds, Alaskan Malamutes, and Huskies**.
- These hybrids exhibit a **mix of wild and domestic traits**, becoming more **wolf-like in behaviour as they mature**.
- **Concerns and Incidents**
 - There have been instances in the **United States** of **wolf-dog hybrids escaping, attacking small dogs, and threatening humans**, raising questions about their **breeding and sale to the public**.
 - Experts question the decision to list **wolf dogs as problematic** due to the **lack of data** on their breeding in India.

- Concerns are raised about the **hybridization** between **wolves and free-ranging dogs** in **India's wilderness**, potentially **threatening native wolf populations**.
- There's also a broader **ethical debate** against **breeding animals for specific traits**, which can lead to **genetic defects and health issues**.

Wildlife and Ethical Considerations:

- **Hybridization** between **wolves and free-ranging dogs**, termed '**Khib-shang**' in **Ladakh**, indicates the **presence of wolf-dog hybrids** in **India's wild areas**.
- Issues arise from **poor pet ownership and abandonment**, leading to **exotic breeds mingling with street and wild canines**, spreading **diseases**, and **contributing to hybridization**.
- The **phenomenon of wolf-dog hybrids** is **not limited to any specific region** but is a broader issue of concern due to potential aggression and livestock predation.

Animal Birth Control or ABC Rules:

- First introduced in **2000** by the **Ministry of Culture**.
- Recently replaced by the **ABC rules 2023**.
- The rules are issued under the **Prevention of Cruelty to animal act, 1960**
- The **policy aims** to implement a **technique** called '**catch-neuter-vaccinate-release**' to control populations of free-ranging dogs and cats.
- **Provisions:**
 - The Rules have been formulated in accordance with the guidelines provided by the Hon'ble Supreme Court related to the **Animal Welfare Board of India and People for Elimination of Stray Troubles**.
 - The **Supreme Court** has specifically mentioned in various orders that **relocation of dogs cannot be permitted**.
 - The Rules aim to provide guidelines for the **sterilization and immunization of stray dogs** through **Animal Birth Control (ABC) programmes**.
 - The responsibility of carrying out ABC programmes lies with the respective **local bodies, municipalities, municipal corporations, and panchayats**.
 - The Municipal Corporations are required to implement the **ABC and Anti Rabies Program jointly**.
 - It provides guidelines on **how to deal with human and stray dog conflicts** without relocating the dogs in an area.
 - It also **emphasises addressing the cruelty involved** in carrying out ABC programmes, **ensuring animal welfare**.

Drawbacks of the rule:

- No benchmark has been set for the number of dogs to be sterilised.
- No proper population estimation of stray dogs by municipalities.
- **ABC Rules ban the euthanasia of rabid animals**, making **India the only country** in the world to follow such a cruel practice. The rules require rabid dogs to "**die a natural death**".

India's sharks and rays: an ancient species on the brink of extinction

Section: Species in news

Context:

- A report by **TRAFFIC** and **WWF-India** have highlighted **rampant shark killing and trade** in **eastern India**, especially **West Bengal**, despite regional underrepresentation in seizure data.

Details:

- The **TRAFFIC-WWF report**, titled "**Netted in illegal wildlife trade: Sharks of India**," indicates nearly **16,000 kg of shark fins** were **seized** from **January 2010 to December 2022**, alongside **significant quantities of shark cartilage and teeth**, with the **illegal trade** being much larger than seizures suggest.
- **Northern West Bengal and adjacent Northeast India areas** serve as **major trafficking routes for shark body parts and other wildlife products**.
- The investigation also revealed that **Digha**, a coastal resort town, is a **hotbed for shark killing and trafficking**, with monthly averages of **1,500 to 6,000 kg of sharks** being **trafficked**, mainly to **Kerala** for their **fins**.
- **Tamil Nadu leads in seizure incidents**, with an estimated actual trade volume 6 to 8 times higher.

- The **Wildlife Crime Control Bureau** and **West Bengal's Forest department**, while less aware, recognize the role of **West Bengal** and **northeastern states** in trafficking to international markets, notably **China**.
- Despite **India's ban on shark finning and trade**, enforcement appears lax, with significant seizures and international demand driving the illegal trade.
- **Shark products** are used in **cuisine, cosmetics, medicine**, and as **curios**, emphasizing the **need for stronger regulatory measures** and **conservation efforts** to protect sharks and their ecosystem roles.

India second largest shark fishing nation in the world:

- **India ranks as the second largest shark fishing nation globally**, following **Indonesia**, primarily due to bycatch in fisheries targeting other species and habitat disruptions from coastal development.
- Between **1985** and **2013**, **India's annual shark catch** remained between **50,000** and **70,000 tonnes**, despite a **64% decline** in the proportion of sharks to total fishery catch.
- This indicates a **significant decrease in shark populations relative to other fish**, especially on the **west coast**, which accounts for nearly **70%** of **India's shark fishery**.
- Notably, the **collapse of fisheries** can occur abruptly, as seen with the **deep-sea shark fishery** around the **Maldives**, which vanished in the early 2000s after being depleted.
- **India** then became a **supplier of liver oil from deep sea sharks** like **gulper sharks** until this fishery too collapsed in **2009** due to **diminishing catches** and **smaller shark sizes**.
- Similarly, **Tamil Nadu** has witnessed an **86% decline** in **catches of rays** such as **guitar fish** and **wedge fishes**.
- These **rapid population declines** are attributed to the **slow growth, late sexual maturity**, and **infrequent reproduction of these species**, leading to long recovery times or non-recovery even after fishing ceases.

Protection of sharks:

- The **first shark species** (and consequently the **first fish species**) to ever be **protected** in **India** was the **whale shark** which was placed under the **Schedule 1 species list** of the **Wildlife (Protection) Act in 2001**.
- **Nine** more species were added to this list, including the **Ganges river shark** (one of few freshwater and estuarine sharks in the world), the **Pondicherry shark** which may already be extinct and the **giant guitarfish**, an exceedingly rare species that is sought after for shark fin soup in **Southeast Asia** and **China**.

Right whales may never breed after run-ins with fishing gear

Section: Species in news

Context:

- In late January 2024, **federal regulators** discovered a **deceased North Atlantic right whale** near Martha's Vineyard, Massachusetts.

Details:

- This incident highlights the **grave threat fishing gear entanglement poses to the critically endangered North Atlantic right whale population**.
- Entanglement not only **physically harms the whales** by embedding ropes into their flesh, **causing infections** and **impeding their ability to feed**, but also **significantly impacts their reproduction capabilities**.
- Recent research emphasizes the **devastating effects** of even "**minor**" entanglements on **female whales' breeding potential**, underscoring the critical need for innovations like ropeless fishing gear to protect this species.

Smaller females having fewer young:

- **North Atlantic right whales** are experiencing **significant reproductive challenges**, with a notable **decline in the number of calves being born**, and **many females have not reproduced at all**.
- This **decrease** is partly due to the **whales' deteriorating health and physical condition**, exacerbated by **entanglements in fishing gear** which have led to a **decrease in adult body size over the decades**.
- **Smaller female whales** are **less likely to reproduce**, contributing to **low calving rates and the species' decline**.

Weak regulations:

- **Current regulations aimed at protecting the North Atlantic right whales**, such as the **U.S. Endangered Species Act**, **Marine Mammal Protection Act**, and **Canada's Species at Risk Act**, fall short in effectively **preventing all types of entanglements**.
- The **categorization of entanglement injuries as minor, moderate, or severe** is **misleading** because even "**minor**" entanglements can **significantly impact whales' ability to reproduce successfully**.

- The **Marine Mammal Protection Act's Take Reduction Plans**, including measures like **using weak links in fishing gear** and **seasonal closures of fishing areas**, are designed to **minimize the risk of entanglement**. However, the research emphasizes that **these measures are insufficient and that the only solution to prevent the extinction of North Atlantic right whales is to eliminate, not just mitigate, entanglements**.
- Despite some **stabilization in whale population numbers**, the **critical need remains for females to start and continue producing calves to ensure the species' survival**, underlining the urgency of addressing entanglement issues comprehensively.

About the North Atlantic Right Whale:

- The **North Atlantic right whale (*Eubalaena glacialis*)** is a type of **baleen whale**.
- It belongs to the **genus *Eubalaena***, which includes **three right whale species**, previously considered one.
- Known for its **docile nature, slow surface-skimming feeding behaviours, coastal proximity, and high blubber content**, which was **valued by whalers for its buoyancy and oil yield**.
- Historically targeted by whalers due to their desirable traits for whaling.
- **Conservation Status:**
 - Among the world's most endangered whales.
 - Protected under the U.S. Endangered Species Act, Marine Mammal Protection Act, and Canada's Species at Risk Act.
- **Population and Migration:**
 - Approximately **356 individuals remain** in the **western North Atlantic Ocean**.
 - Migrate between **feeding grounds** in the **Labrador Sea** and **winter calving areas** off **Georgia and Florida**, areas with significant shipping traffic.
 - In the **eastern North Atlantic**, with a total population in the low teens, they may be **functionally extinct**.
- **Threats:**
 - Major threats include **vessel strikes** and **entanglement in fixed fishing gear**.
 - Nearly **half of all North Atlantic right whale mortality** since **1970** is attributed to these causes, significantly hindering their recovery efforts.

An Illustrated Guide on the Butterflies and Moths (Lepidoptera) of India

Section: Species in news

Context:

- The Zoological Survey of India published a book entitled, '**An illustrated guide to the Lepidoptera of India: taxonomic procedures, family characters, diversity and distribution**'.

More on news:

- The present work is one of the outputs from the **6th Asian Lepidoptera Conservation Symposium, hosted by Zoological Survey of India (ZSI) in 2019**, where a dire need was broadly discussed for a book which can guide both amateurs and professionals in the field of lepidopterology.
- The project was initiated during the **lockdowns of the COVID-19 pandemic**.
- The diversity of global Lepidoptera is updated to **166,320 species, 143 families and 43 super families, of which 13,124 species, 101 families and 31 super families occur in India**.
- In this book, the authors rectified a taxonomic glitch and described a new family of Lepidoptera i.e., **Heliocosmidae**.

About the document:

- This document aims to bring a summary of the main diagnostic characters for all the families and super families of **Butterflies and Moths found in India**.
- Key attributes of the **basal splitting and the superfamily compositions of various clades of Butterflies and Moths are summarized**.
- The book outlines the methods to collect and curate voucher material in the **field, taxonomic procedures followed in laboratory, superfamily and family level identification** and the knowledge about the lepidopteran diversity and patterns of distribution, globally.
- Both academically technical and **simpler, natural history field guide style is the core strength of the book**.

Uttarakhand to translocate four tigers to Rajasthan says official

Section: Species in news

Context:

- The Uttarakhand government has approved the relocation of four tigers to Rajasthan, responding to a request from the western state's authorities. This decision comes amidst similar discussions for tiger translocation to Odisha.

Details:

- The Principal Chief Conservator of Forest (Wildlife) has initiated the selection process for tigers to be relocated to Rajasthan.
- These tigers will be sourced from the buffer zone, not the protected forest area, in alignment with National Tiger Conservation Authority (NTCA) guidelines.
- Following a successful tiger relocation project within Uttarakhand—from Corbett Tiger Reserve to Rajaji Tiger Reserve—the states of Rajasthan and Odisha have sought Uttarakhand's expertise for their tiger translocation efforts. The Odisha request is currently under consideration.
- Alongside the approval for tiger relocation, the Uttarakhand government has also agreed to share its relocation expertise with forest personnel in Rajasthan, highlighting the collaborative approach towards wildlife conservation.

Importance of translocation of tigers:

- This initiative reflects a broader commitment to wildlife conservation, emphasizing the importance of genetic diversity and habitat expansion for tigers. By relocating tigers from areas with higher populations to those with fewer or no tigers, the efforts aim to foster healthier tiger populations and ecosystems.
- The willingness of the Uttarakhand government to assist other states not only in relocating tigers but also in imparting relocation skills signifies a noteworthy instance of interstate collaboration in conservation efforts, potentially setting a precedent for future wildlife management and conservation projects.

Rajaji National Park

- It is nestled between the Shivalik ranges and the Indo-Gangetic plains.
- Broadleaved deciduous forests, riverine vegetation, scrubland, grasslands and pine forests form the range of flora in this park.
- The park is spread over three districts of Uttarakhand: Haridwar, Dehradun and PauriGarhwal.
- The Ganga and Song rivers flow through the park.
- It is at the northwestern limit of distribution for both elephants and tigers in India and has the largest population of elephants in Uttarakhand.
- The Park is also home to the Great Pied Hornbill, Himalayan Pied Kingfisher and the fire tailed sunbird.
- This area is the first staging ground after the migratory birds cross over the Himalayas into the Indian subcontinent.
- In 2015, Rajaji National Park was notified as a tiger reserve by the central government. Benefits of Tiger Reserve – Protected area for Tigers, Tourist attraction, Huge Development fund for the park, Eco-Tourism development.
- Jim Corbett National Park is the oldest national park in India and was established in 1936 as Hailey National Park to protect the endangered Bengal tiger.
- It is located in Nainital district and Pauri Garhwal district of Uttarakhand and was named after hunter and naturalist Jim Corbett.
- The Park was the first to come under the Project Tiger initiative.
- The Park encompasses the Patli Dun valley formed by the Ramganga river.
- Ramganga, Sonanadi, Mandal, Palain and Kosi are the major rivers flowing through the Corbett National Park.
- The national park is a protected area covered by the World Wide Fund (WWF) for Nature under their Terai Arc Landscape Program.

What are the new rules for elephant transfer

Section: Species

Why in the news? The center has notified Captive Elephant (transfer or transport rule) to liberalized conditions under which the elephant may be transferred within or between states

Provision for transfer and transport of elephant under Wildlife Protection Act (WPA) 1972:

1. As per the WPA 1972, elephants are a Schedule 1 species they cannot be captured and traded under any circumstances
2. Section 12 of the act allows scheduled animals to be translocated for special purposes like
 1. Education and scientific research

2. Management of wildlife without harming any wild animal
3. Collection of Specimen for recognised zoos or museums
3. Section 40 of WLA 1972 prohibits the acquisition, possession and transfer of captive elephants without written permission of the Chief Wildlife warden of the states

Provisions in updates rule:

1. **Provides relaxation** under which captive elephants can change owners or transferred
2. **Intra state transfer,**
 1. Elephant health to be ratified by veterinarian
 2. The deputy conservator of the forest has to establish that the animal's current habitat and prospective habitat are suitable
 3. The chief wildlife warden on receipt of such documents may reject or approve the transfer
3. **Interstate transfer of elephants:**
 1. The genetic profile of the elephant has to be registered with the environment ministry
 2. Only the permission of the Chief Wildlife warden of the originating and recipient states permission required (earlier required permission from all states' Chief Wildlife warden through which elephant passes)

Challenges of new rules:

- The **Wildlife Protection Act** is a protective law however new rules provide more relaxation so there is possibility of misuse of it
- A new amendment in 2021 allows the transfer of elephants for religious or any other purpose, such a broad interpretation could accelerate trafficking and illegal commercial transaction

About Elephants

Asian Elephants:

1.
 - There are three subspecies of Asian elephant which are the Indian, Sumatran and Sri Lankan.
 - The Indian subspecies has the widest range and accounts for the majority of the remaining elephants on the continent.
 - Global Population: Estimated 20,000 to 40,000.
 - **IUCN Red List: Endangered.**
 - **Wildlife (Protection) Act, 1972: Schedule I.**
 - **CITES: Appendix I**

African Elephants:

1.
 - There are two subspecies of African elephants, the Savanna (or bush) elephant and the Forest elephant.
 - Global Population: Around 4,00,000.
 - **IUCN Red List Status:**
 - **African Savanna Elephant: Endangered.**
 - **African Forest Elephant: Critically Endangered**
 - **CITES: Appendix II**

Animal Behaviour:

- Led by a matriarch, elephants are organized into complex social structures of females and calves, while male elephants tend to live in isolation or in small bachelor groups. A single calf is born to a female once every four to five years and after a gestation period of 22 months—the longest of any mammal. Calves are cared for by the entire herd of related females. Female calves may stay with their maternal herd for the rest of their lives, while males leave the herd as they reach puberty. Forest elephants' social groups differ slightly and may be comprised of only an adult female and her offspring. However, they may congregate in larger groups in forest clearings where resources are more abundant.
- Elephants need extensive land areas to survive and meet their ecological needs, which includes food, water, and space. On average, an elephant can feed up to 18 hours and consume hundreds of pounds of plant matter in a single day. As a result, as they lose habitat, they often come into conflict with people in competition for resources.

Ecological importance of Elephants

- They help in dispersal of seeds

- They help in growth of vegetation in forest

Steps taken by the Government for the conservation of elephants:

1. **Legal measure:** Wildlife Protection Act 1972, schedules 1 species so the highest level of protection
2. **Project Elephant:** Launched in 1992 as a centrally sponsored scheme to protect the elephant, their habitats, and corridor
3. Declaration of elephant as national heritage animal of India
4. **International level:** Appendix I of CITES and Appendix I of the Convention on Migratory Species

Saving India's wild 'unicorns'

Section: Species in news

RhODIS (Rhino DNA Index System) India programme:

- Initiated by the **Veterinary Genetics Laboratory** of the **University of Pretoria** by creating a database using the **unique DNA profile of individual rhinos**.
- In **2016**, the **Ministry of Environment, Forests and Climate Change (MoEFCC)**, **Government of India** in partnership with **Wildlife Institute of India (WII)**, the **forest departments of Assam, West Bengal and Uttar Pradesh**, and **WWF India** launched the **RhODIS India programme**.
- It is a **wildlife forensics tool** that was specially developed for **investigating wildlife crime cases**.
- **Aim:** To build a **DNA database** to aid scientific management of the population and combat crimes against the species.

How does RhODIS work?

- **Wildlife Institute of India** houses the **RhODIS India laboratory** that carries out **all the analyses** and **maintains the DNA database** as **notified** by the **Government of India**.
- In addition to creating the **DNA database** from **horn, tissue, and blood samples**, rhino dung was also used.
- **RhODIS** uses a **DNA indexing system** whereby **genetic sequences** which are created to get a signature unique to each individual rhino.
- In **India**, the **laboratory protocols** have been finalized by testing different types of samples like tissue, blood and dung.
- The **RhODIS India database** now has the **DNA profiles** of more than **500 individual rhinos** and around **400** of these are derived from dung samples collected from all the rhino bearing areas of India.

Ideal habitat for Rhinos:

- **Manas national park** is considered an **ideal rhino habitat** with its **alluvial grasslands, semi-evergreen forest and moist and dry deciduous forests**, as well as elevation ranging approximately between **50 and 250 metres above mean sea level (AMSL)**, and the **Manas-Beki river system** providing a **constant source of water**.

Crucial steps to ensure the future survival and well-being of the newly established rhino population at Manas:

- Genetic management plans to maintain genetic diversity and prevent inbreeding; sustainable habitat management practices to restore preferred rhino habitats;
- The establishment of a robust disease surveillance system to guard against potential health threats.
- Habitat management

Protected areas considered for Rhino translocation:

- Manas national park (Assam)
- Laokhwa WLS (Assam)
- Burhachapori WLS (Assam)

More about Indian Rhinoceros

- The Indian rhinoceros (**Rhinoceros unicornis**) is found only in the **Brahmaputra valley, parts of North Bengal, and parts of southern Nepal**.
- It has a **single black horn** that can **grow up to 60 cm**, and a tough, grey-brown hide with skin folds, which gives the animal its characteristic armour-plated look.
- The Indian rhino is listed as **vulnerable** in the **IUCN Red List**, it was **earlier** placed in the **endangered category**.
- It is listed as a **Schedule I animal** in the **Wildlife Protection Act, 1972**.

- According to the **WWF**, there are around **3,700 Indian rhinos in the wild today**. Assam's **Kaziranga National Park** alone has **2,613 animals**, according to a census carried out in March 2022. There are more than **250 other rhinos in the Orang, Pobitora, and Manas parks**.

Why are Rhinos poached

- Rhinos have been poached for their horn, which is prized in some cultures.
- Ground rhino horn is used in **traditional Chinese medicine** to cure a **range of ailments, from cancer to hangovers, and also as an aphrodisiac**.
- In **Vietnam**, possessing a rhino horn is considered a **status symbol**

Indian Rhino Vision 2020

- Launched in 2005, Indian Rhino Vision 2020 is an ambitious effort to attain a wild population of at least 3,000 greater one-horned rhinos spread over seven protected areas in the Indian state of Assam by the year 2020.
- Seven protected areas are Kaziranga, Pobitora, Orang National Park, Manas National Park, Laokhowa wildlife sanctuary, Burachapori wildlife sanctuary and Dibrusaihowa wildlife sanctuary.
- It is a collaborative effort between various organisations, including the International Rhino Foundation, Assam's Forest Department, Bodoland Territorial Council, World Wide Fund – India, and the US Fish and Wildlife Service.

Manas National Park and Tiger Reserve:

- **Manas National Park** is a national park, Project Tiger reserve, and an elephant reserve in **Assam, India**.
- Located in the **Himalayan foothills**, it borders the **Royal Manas National Park in Bhutan**.
- The park is known for its **rare and endangered endemic wildlife** such as the **Assam roofed turtle, hispid hare, golden langur and pygmy hog**.
- Manas is also famous for its population of wild **water buffalo**. Because of its exceptional biodiversity, scenery, and variety of habitats, **Manas National Park** is a **biosphere reserve** and a **UNESCO World Heritage Site**.
- The name of the park originated from the **Manas River**.
- The **Manas river** is a **major tributary of Brahmaputra River**, which passes through the heart of the national park.
- **On 21 June 2011**, it was **removed from the List of World Heritage in Danger** and was commended for its efforts in preservation.
- **There are two major biomes present in Manas:**
 - **The grassland biomes:** pygmy hog, Indian rhinoceros (re-introduced in 2007 after extinction due to heavy poaching during the Bodo uprising), bengal florican, wild Asian buffalo, etc.
 - **The forest biomes:** slow loris, capped langur, wild pig, sambar, great hornbill, Malayan giant squirrel or black giant squirrel, Chinese pangolin etc.
- **Vegetation:**
 - The **monsoon forests of Manas** lie in the **Brahmaputra Valley semi-evergreen forests ecoregion**. The combination of **Sub-Himalayan Bhabar Terai region** with **riverine succession** leading up to the **Himalayan subtropical broadleaf forests** makes it one of the richest biodiversity areas in the world.
- **The main vegetation types are:**
 - Sub-Himalayan light alluvial semi-evergreen forests in the northern parts.
 - East Himalayan mixed moist and dry deciduous forests (the most common type).
 - Low alluvial savanna woodland, and
 - Assam Valley semi-evergreen alluvial grasslands which cover almost 50% of the park.

Power threat to the bustard

Section: Species in news

Context:

- The Supreme Court will review its April 2021 order to bury underground all power lines in the habitat of the **Great Indian Bustard (GIB)**, after the Centre found the order "**practically impossible to implement**" over long distances.

Details:

- The court created a seven-member committee that will suggest steps to protect and conserve the GIB, identifying critical areas where power lines may have to go underground.

Why do windmills and powerlines kill bustards?

- GIBs have a narrow frontal vision and large size.
- Unlike some birds that have panoramic vision around their head, species like raptors and bustards have extensive blind areas above their head forward to scan the ground below, they fly blind in the direction of travel.
- **Other threats to GIBs:**
 - Free-ranging dogs, ferals and Chinkaras
 - Widespread use of pesticides in farmlands

What is the Great Indian Bustard?

- One of the **heaviest flying birds endemic to the Indian subcontinent.**
- **State Bird** of Rajasthan.

Habitat:

- Arid grasslands.
- A Maximum number of GIBs were found in Jaisalmer and the Indian Army-controlled field firing range near Pokhran, Rajasthan.
- Other areas: **Gujarat, Maharashtra, Karnataka and Andhra Pradesh.**

Protection Status:

- **IUCN Status:** Critically Endangered.
- Listed in **Wildlife Protection Act's** Schedule 1.

Significance of GIBs in the ecosystem-

- Terrestrial birds spend most of their time on the ground, feeding on insects, lizards, grass seeds, etc. **GIBs** are considered the **flagship bird species of grassland** and hence **barometers of the health of grassland ecosystems.**

Great Indian Bustard: Conservation efforts

- The **Supreme Court** in April 2021 ordered that **all overhead power transmission lines in core and potential GIB habitats in Rajasthan and Gujarat** should be **made underground.**
 - The Great Indian Bustard is listed in Schedule-I of the Wild Life (Protection) Act, 1972, thereby, according it highest degree of legal protection from hunting.
 - Important habitats of Great Indian Bustards are designated as National Parks/Sanctuaries for their better protection.
 - The species has been identified for conservation efforts under the component 'Species Recovery Programme' of the Centrally Sponsored Scheme (CSS)-Development of Wildlife Habitat. Financial and technical assistance is provided to the State/Union Territory Governments under the Centrally Sponsored Scheme of Development of Wildlife Habitat for providing better protection to Great Indian Bustard and its habitat.
- The Great Indian Bustard has been included in the **Appendix I of Convention on Migratory Species (CMS)** of the basis of proposal submitted by India. It was also the mascot of the prestigious 13th CMS Conference of Parties held in Gandhinagar giving wider publicity for the conservation of the species

Fish otolith ornaments make market debut

Section: Species

Context:

- Ornaments from **fish otoliths**, named '**Sea gems**', have made a market debut, with the efforts of a group of enthusiastic fisherwomen in **Vizhinjam**, trained by scientists from the **Central Marine Fisheries Research Institute (CMFRI).**

Otoliths:

- Also called **statoconium, otoconium** or **statolith**, is a **calcium carbonate structure** in the **sacculle** or **utricle** of the **inner ear**, specifically in the **vestibular system of vertebrates.**
- They have been identified in both extinct and extant vertebrates.

Fish otoliths:

- **Fish otoliths** are **biomineralised ear stones** that **help fish hear** and provide them with a **sense of balance.**
- **Otoliths** are important in fish studies as they have **species-specific shapes** and **grow throughout their life.**
- **Counting the annual growth rings** on the **otoliths** is a **common technique** in **estimating the age of fish.**

ICAR-Central Marine Fisheries Research Institute (CMFRI):

- Established by the **Government of India** on February 3rd **1947** under the **Ministry of Agriculture and Farmers Welfare** and later it joined the **ICAR** family in **1967**.
- **Headquarters:** Kochi, Kerala.

Geography

2023-24 El Nino among five strongest on record, will continue fueling heat in 2024: WMO

Section: Climatology

Context: The prevailing El Nino conditions fueled record temperatures and extreme events the world over, with 2023 being the warmest on record

Details:

- As per **World Meteorological Organization 2023-24 El Nino** has peaked as **one of the five strongest** on record and will continue to impact global climate in the coming months despite a weakening trend.
- The UN agency also said above-normal temperatures are predicted over almost all land areas between March and May.
- The prevailing El Nino conditions fuelled record temperatures and extreme events the world over, with 2023 being the warmest on record.
- According to the **European Union's Copernicus Climate Change Service**, the global mean temperature breached the **5-degree Celsius** threshold for an entire year for the first time in January.
- A permanent breach of the 1.5-degree Celsius limit, specified in the Paris Agreement, however, refers to long-term warming over many years.
- In its latest update, the **World Meteorological Organization (WMO)** said there is about a 60% chance of El Nino persisting during March-May and an 80% likelihood of neutral conditions (neither El Nino nor La Nina) during April to June.
- There is a chance of La Nina developing later in the year but those odds are currently uncertain, it said.
- Scientists closely tracking the development in India have said La Nina conditions setting in by June-August could mean monsoon rains would be better this year than in 2023.
- Every month since June 2023 has set a new monthly temperature record -- and 2023 was, by far, the warmest year on record.
- El Nino has contributed to these record temperatures but heat-trapping greenhouse gases are unequivocally the main culprit.
- "Ocean surface temperatures in the equatorial Pacific clearly reflect El Nino. But sea-surface temperatures in other parts of the globe have been persistently and unusually high for the past 10 months. The January 2024 sea-surface temperature was by far the highest on record for January. This is worrying and cannot be explained by El Nino alone.
- The current El Nino event, which developed in **June 2023**, was at its strongest between **November and January**. It displayed a peak value of about 2.0 degrees Celsius above the 1991 to 2020 average sea-surface temperature for the eastern and central tropical Pacific Ocean. This made it **one of the five strongest El Nino events ever**, though it was weaker than the 1997-98 and 2015-2016 events.
- El Nino is mainly a **seasonal climate phenomenon** with climate impacts on **seasonal climate averages** but can make **extreme weather** and climate-events more likely in certain regions.
- The WMO said the seasonal forecasts are found to be more accurate during El Nino and La Nina events, particularly in the tropics, and this emphasises the pivotal role of early warnings to support decision-making and enhance preparedness and anticipatory action.
- El Nino events have a major impact on societies and economies. Accurate seasonal forecasts from the WMO community helped countries prepare in advance to try to limit the damage in climate sensitive sectors like agriculture, water resources and health.

What is El Nino?

- It is a periodic warming of the ocean surface in the central and eastern tropical Pacific Ocean -- occurs every two to seven years on an average, and typically lasts nine to 12 months.
- It is associated with increased rainfall in the Horn of Africa and the southern US, and unusually dry and warm conditions in Southeast Asia, Australia and southern Africa.

Spring season 'disappearing' in many States, shows study

Section: Climatology

Context:

- A **50-year study of meteorological data across Indian states and territories** reveals a **significant warming trend**, particularly **affecting the winter and spring seasons**.

Details of research findings:

- Researchers from **Climate Trends** analyzed **average monthly temperatures from 1970 to the present**, covering **33 states and union territories**, to **examine the impact of global warming**.
- They found that **every region experienced 'net warming' during winter**, with **Manipur** registering the **highest increase of 2.3°C** and **Delhi** the **lowest at 0.2°C**.
- **Winter** was identified as the **fastest warming season in 12 regions**, closely followed by **autumn in 13 regions**.
- **Distinct regional patterns emerged**, with **southern India** experiencing **substantial warming in December and January**, while the **northern regions** showed **weaker warming** or even **cooling** during these months.
- However, **all areas warmed in February**, with the **northern regions** experiencing a **stark contrast** between the **cooler January temperatures** and **much warmer conditions in February**, suggesting an **abrupt transition to warmer weather** that traditionally occurs in March.
- Significantly, **Rajasthan** and **eight other states and territories** recorded a **warming difference of more than 2°C** between **January and February**, supporting observations that **spring feels markedly shorter in many parts of India**.
- The study also **linked the observed warming trends and reduced winter rainfall in northern India** to **changes in Western Disturbances and jet stream patterns**, which are **crucial for bringing moisture to the region during winter**.

One of the major gaps in our weather observational system is over the oceans: Elena Manaenkova

Section: Climatology

Context:

- The **World Meteorological Organization (WMO)** commemorates **World Meteorological Day** every **March 23**, marking the **establishment of the UN body in 1950**. The day highlights the **crucial role of meteorological and hydrological services in society's safety and well-being**.
- **2024 Theme:** The theme for **World Meteorological Day 2024** is **“At the frontline of climate action,”** reflecting **urgent climate, weather, and water-related issues**.

Global Greenhouse Gas Watch Programme (G3W):

- It is a **new greenhouse gas (GHG) monitoring initiative** of the **World Meteorological Organization (WMO)**.
- **G3W** will fill critical information gaps, providing an **integrated, operational framework** under **all space-based and surface-based observing systems** under one roof, along with modelling and data assimilation capabilities.
- It will build on **WMO's experience** in coordinating international collaboration in predicting the weather and analyzing climate on long-standing activities in greenhouse gas monitoring and research under the guidance of the **Global Atmosphere Watch, established in 1989**.
- **G3W** predicts a top-down approach to the flux evaluation, which builds on existing capabilities in surface- and space-based observations and modelling, ensuring the timely exchange of all observations and data.
- **The G3W will consist of four main components:**
 1. Comprehensive, sustained, global surface- and satellite-based observations of CO₂, methane, and nitrous oxide concentrations, partial column amounts, total column amounts, vertical profiles, and fluxes supporting oceanic, meteorological, and terrestrial variables, internationally exchanged as rapidly as possible.
 2. Prior estimates of the GHG emissions based on the activity data and process-based models.
 3. Global high-resolution Earth system models representing GHG cycles.
 4. Data assimilation systems combining the observations with model calculations to generate products of higher accuracy.

“Early Warnings for All” Initiative:

- The **“Early Warnings for All” initiative** is a groundbreaking effort to ensure that everyone on Earth is protected from hazardous weather, water, or climate events through life-saving early warning systems by the end of **2027**.
- **Project partners:**
 - The **Early Warnings for All initiative** is **co-led** by the **World Meteorological Organization (WMO)** and the **United Nations Office for Disaster Risk Reduction (UNDRR)**, with support from the **International Telecommunication Union (ITU)** and the **International Federation of Red Cross and Red Crescent Societies (IFRC)** and other partners.

- The **Early Warnings for All initiative** partners beyond the UN with the **Red Cross and Red Crescent movement, civil society, Big Tech companies, donor governments, development banks, and the insurance sector.**

The **Early Warnings for All initiative** is built around four key pillars:

1. **Disaster risk knowledge and management**
 - Systematically gather data and conduct risk evaluations under the supervision of UNDRR.
2. **Detection, observation, monitoring, analysis, and forecasting**
 - Advancing hazard monitoring and early warning systems under the direction of WMO.
3. **Warning dissemination and communication**
 - Conveying clear risk information and early warnings under the leadership of ITU.
4. **Preparedness and response capabilities**
 - Develop national and community response capacities under the guidance of IFRC.

Global Cryosphere Watch (GCW) system:

- The **WMO** has established the **Global Cryosphere Watch system** but faces challenges in **obtaining sufficient physical instrumentation data.**
 - The **World Meteorological Organization's Global Cryosphere Watch (GCW)** is an **international mechanism** for supporting **all key cryospheric in-situ and remote sensing observations.**
 - **GCW** provides authoritative, clear, and useable data, information, and analyses on the past, current and future state of the cryosphere.
- There's a pressing need for a **strategic plan to understand and predict changes in the cryosphere**, which significantly **impacts global weather and climate patterns.**
- This includes addressing observational network deficiencies and facilitating policy-driven information exchange among affected countries.

Tropical cyclones of higher intensity demand a new category

Section: Climatology

Tropical cyclones:

- **Tropical cyclones**, forming over **warm tropical oceans** with **sea surface temperatures above 26.5°C**, are **powerful storms** characterized by **strong winds, heavy rain, and storm surges**, posing significant risks to coastal areas.
- Annually, out of **85 tropical storms**, **more than half become cyclones**, predominantly in the **Western Pacific**, the most active basin, while the **North Indian basin**, though **only contributing to 4% of global cyclones**, is highly vulnerable to their impacts.

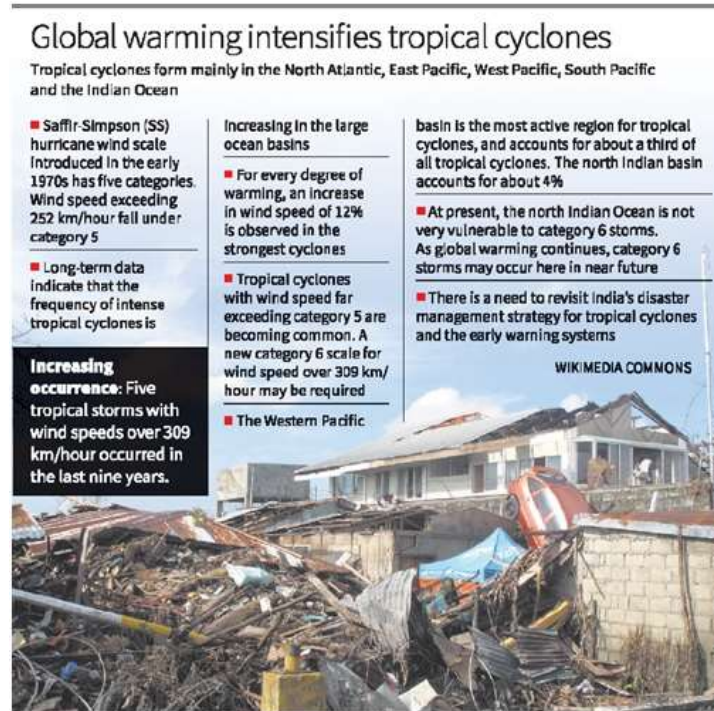
Saffir-Simpson scale to measure the intensity of tropical cyclones:

- The **Saffir-Simpson scale**, with **categories 1 through 5** based on **wind speeds**, is used to **communicate the intensity and risk of these cyclones to the public**, highlighting the **severe damage potential of category 5 storms** with winds exceeding **252 km/h.**

Category	Wind speed			Storm surge	
	mph	km/h	kn	ft	m
Five	≥ 156	≥ 250	≥ 136	> 18	> 5.5
Four	131-155	210-249	114-135	13-18	4.0-5.5
Three	111-130	178-209	96-113	9-12	2.7-3.7
Two	96-110	154-177	83-95	6-8	1.8-2.4
One	74-95	119-153	64-82	4-5	1.2-1.5
Additional classifications					
Tropical storm	39-73	63-117	35-63	0-3	0-0.9
Tropical depression	0-38	0-62	0-34	0	0

Impact of Global warming on the tropical cyclones:

- The increase in greenhouse gas emissions and consequent global warming, with a 1.10°C rise since pre-industrial times, has affected ocean temperatures, thereby enhancing the intensity and potential destructiveness of tropical cyclones.
- Observations indicate an increase in the frequency of intense storms, with each degree of warming leading to a 12% increase in wind speed and a 40% rise in destructive potential.
- Additionally, cyclones are moving poleward and forming at higher latitudes, intensifying more rapidly, lasting longer, and producing more rainfall upon landfall, as evidenced by the record-setting 37-day duration of tropical cyclone Freddy in 2023.



Need for Category 6:

- Recent research highlights that the intensity of storms is surpassing Category 5, suggesting the need for a new Category 6 for cyclones with wind speeds above 309 km/h, due to global warming.
- Analysis of 197 Category 5 cyclones from 1980-2021 shows an increase in such intense storms, especially in the latter years, with some exceeding the proposed Category 6 threshold.
- Future climate simulations indicate a rise in these extreme events. Introducing a Category 6 could enhance awareness and preparedness for these increasingly potent storms.
- Given these trends, even regions currently less vulnerable, like the North Indian Ocean, may face Category 6 cyclones, prompting a reevaluation of disaster management and early warning systems.

Cabinet approves royalty rates for mining of 12 critical and strategic minerals

Section: Economic Geography

Context:

- The Union Cabinet chaired by Prime Minister Shri Narendra Modi approved the amendment of Second Schedule to the Mines and Minerals (Development and Regulation) Act, 1957 ('MMDR Act') for specifying rate of royalty in respect of 12 critical and strategic minerals.

More on news:

- These minerals include Beryllium, Cadmium, Cobalt, Gallium, Indium, Rhenium, Selenium, Tantalum, Tellurium, Titanium, Tungsten and Vanadium.
- This completes the exercise of the rationalization of royalty rates for all 24 critical and strategic minerals.
- It may be noted that the Government had notified the royalty rate of 4 critical minerals, viz., Glauconite, Potash, Molybdenum and Platinum Group of Minerals on 15th March, 2022 and of 3 critical minerals, viz., Lithium, Niobium and Rare Earth Elements on 12th October, 2023.

About The Mines and Minerals (Development and Regulation) Amendment Act, 2023:

- The **Mines and Minerals (Development and Regulation) Amendment Act, 2023**, which came into force from 17th August, 2023, had listed **24 critical and strategic minerals in Part D of the First Schedule of the MMDR Act**.
- The amendment provided that **mining lease and composite licence of these 24 minerals shall be auctioned by the Central Government**.
- The **Second Schedule of the MMDR Act provides royalty rates for various minerals**.

Item No. 55 of the Second Schedule:

- Item No. 55 of the Second Schedule provides that royalty rate for the minerals whose royalty rate is not specifically provided therein **shall be 12% of the Average Sale Price (ASP)**.
- If the royalty rate for these is not specifically provided, then their **default royalty rate would be 12% of ASP**, which is considerably high as compared to other critical and strategic minerals.
- This royalty rate of **12% is not comparable with other mineral producing countries**.

About Critical Minerals:

- Critical minerals refer to **mineral resources, both primary and processed, which are essential inputs in the production process of an economy**, and whose supplies are likely to be disrupted due to the risks of non-availability or unaffordable price spikes.
- To tackle such supply risks, **major global economies periodically evaluate which minerals are critical for their jurisdiction through a quantitative assessment**.
- Critical minerals have become essential for economic development and national security in the country.
- Critical minerals such as **Cadmium, Cobalt, Gallium, Indium, Selenium and Vanadium** and have uses in **batteries, semiconductors, solar panels, etc.**
- These minerals have gained significance in view of India's commitment towards energy transition and **achieving net-zero emission by 2070**.

Offshore Mineral Blocks for Auction

Section: Eco Geography

1. **Shortlisted Blocks:**

- The Mines Ministry has shortlisted around **10 offshore mineral blocks** for potential auction.

2. **Location:**

- Blocks are located on **both the east coast and west coast of India**.

3. **Minerals:**

- Expected minerals include:
 - **Construction sand**
 - **Lime mud**
 - **Others**

4. **Number of Identified Blocks:**

- Ministry has identified **35 offshore mineral blocks** so far.
- Potential auctions would mark the **first offshore mining activities** in India.

5. **Exclusive Economic Zone (EEZ):**

- Some blocks are in the **Exclusive Economic Zone** of India, beyond the territorial waters (12 nautical miles).
- Target minerals: **Lime mud and polymetallic nodules**.

6. **Consultations:**

- Inter-ministerial discussions underway **with Ministries like Defence for necessary No-Objection Certificates (NOCs)**.
- Aim to avoid any overlapping with existing projects.

7. **Timeline:**

- Auctions likely to occur by **June-July 2024**.

8. **Mineral Usage:**

- *Lime mud* primarily imported, used in:
 - Steel
 - Paint
 - Pharma
 - Glass industries
- *Marine sand deposits* (used in construction) reported off the coast of Kerala.

9. **Auction Rules:**

- Discussion on rules:
 - Auction for *production in-lease* can be made at *G3 level of exploration* for silica sand and lime mud.

10. **Offshore Mining Stages:**

- *Four stages* of exploration:
 - Reconnaissance (G4)
 - Preliminary exploration (G3)
 - General exploration (G2)
 - Detailed exploration (G1)

11. **Deep-sea Mining:**

- *Offshore mining* or *deep-sea mining* involves retrieving mineral deposits from *ocean depths below 200 metres*.
- Process:
 - Submersible crafts with *suction pipes* creep across the seabed, stirring up metallic objects.
 - *Poly-metallic nodules* sorted, unwanted sediment flushed back into the sea.

12. **Demand:**

- *Growing demand* for metals like those in nodules for:
 - Wind turbines
 - Solar panels
 - Batteries
 - Smartphones
- Essential for *clean-energy technologies*.

13. **Standard Operating Procedures:**

- Centre is developing *SOPs* for private sector bidders winning exploration rights.

Offshore mineral auctions mark a significant step in India's mining sector, **potentially unlocking valuable resources and catering to the demand for essential minerals in various industries.**

Offshore Areas Mineral (Development and Regulation) Amendment Bill, 2023: Salient Features

Introduction of Auction Regime

- **Purpose:** Major reform in allocating operating rights in offshore areas.
- **Method:** Operating rights granted through auction via competitive bidding.

Types of Operating Rights

1. **Production Lease:**

- Granting to private sector through auction.
- *Duration fixed at 50 years, aligning with MMDR Act.*
- *Renewal provision removed.*

2. **Composite License:**

- Two-stage operating right for exploration and production.
- Private sector granted through auction.

Operating Rights for PSUs

- Mineral-bearing areas reserved by Central Government.
- PSUs exclusively granted operating rights for atomic minerals.

Area Acquisition Limit

- **Maximum Area:**
 - Restricted to 45 minutes latitude by 45 minutes longitude.
 - Applies to any mineral or prescribed group of associated minerals.

Non-Lapsable Offshore Areas Mineral Trust

- **Purpose:**
 - Ensure funds for:
 - Mitigation of adverse impacts.
 - Disaster relief.
 - Interest and benefits for affected parties.
 - **Funding:**
 - Additional levy on mineral production, up to one third of royalty.
 - Rate to be prescribed by Central Government.
 - **Management:**
 - Trust to maintain a fund under the Public Account of India.

Ease of Business Measures

- **Transfer of Licenses:**
 - Provision for easy transfer of composite license or production lease.

Timelines for Production

- **Commencement:**
 - Introduction of timelines for starting production and dispatch.
 - Ensures timely utilization of leases.

Revenue Allocation

- **Royalty and Premiums:**
 - Revenues from offshore mineral production accrue to Government of India.

Significance of Offshore Mineral Resources in India

- **Resource Potential:**
 - Vast mineral resources within Exclusive Economic Zone (EEZ).
- **GSI Findings:**
 - Lime mud, construction-grade sand, heavy mineral placers, phosphorite, ferromanganese nodules and crusts.
- **Economic Growth:**
 - Utilization essential for India's high-growth economy.
- **Public-Private Partnership:**
 - Encouragement of public-private partnerships.
 - Private sector brings expertise and technology for exploration.

Conclusion

The Offshore Areas Mineral (Development and Regulation) Amendment Bill, 2023 introduces crucial reforms in India's offshore mining sector. **By adopting an auction regime, granting specific rights to PSUs for atomic minerals, setting area acquisition limits, and establishing a non-lapsable trust, the Bill aims to promote transparency, responsible mining, and economic growth.**

It aligns with India's vision of harnessing its maritime resources for sustainable development while ensuring benefit for all stakeholders.

Understanding the International Seabed

- The **international seabed**, also known as the Area, refers to the seabed and ocean floor beyond national jurisdiction.
- It covers about **54%** of the world's oceans.
- Recognized under the **United Nations Convention on the Law of the Sea (UNCLOS)** as the "*common heritage of mankind*," it is to be managed for the benefit of all nations.

The Role of International Seabed Authority (ISA)

- **Establishment:** ISA is an autonomous international organization established under UNCLOS.
- **Mandate:** It **regulates and manages all mineral-related activities** in the international seabed.
- **Functions:**
 - Grants licenses and regulates exploration and exploitation activities.
 - Ensures activities protect the marine environment.
 - Promotes equitable and efficient resource utilization.

Deep Sea Mining:

Definition: Involves extracting mineral deposits and metals from the ocean floor.

- **Types:**
 1. Mining **polymetallic nodules**.
 2. Extracting massive seafloor sulphide deposits.
 3. **Stripping cobalt crusts from rocks**.
- **Materials:** These areas contain minerals vital for technologies such as **batteries, cellphones, and renewable energy**.

Current Regulations on Deep Sea Mining

- Governed by the **United Nations Convention on the Law of the Seas (UNCLOS)**.
- **High Seas:** Areas beyond 200 nautical miles from any nation's coast.
- **Common Heritage:** The seabed and its resources are considered humanity's shared wealth.
- **Management:** Must protect **global interests, support research, and safeguard marine environments**.

Challenges of Offshore Mining

- Environmental Impact
- Deep-Sea Ecosystem
- Technological Challenges
- Regulatory Issues
- Resource Conflicts
- Economic Viability
- Social Impact
- Waste Management
- Accidents and Spills
- Lack of Coordination

Launch of Exploration Licence for Critical and Deep-Seated Minerals by the States of Karnataka and Rajasthan - A First in the Country

Section: Eco geography

Context:

Karnataka and Rajasthan launched an auction of Exploration Licence (EL) for critical and deep seated minerals on 06.03.2024.

More on news:

- Exploration License blocks are being auctioned for the first time in the country.
- **Karnataka** launched an auction of one block of **Gold, Copper and Lithium** and **Rajasthan** launched an auction of **three blocks of Rare Earth Elements, Rare Metal and Potash** minerals.
- The **Mines and Minerals (Development and Regulation) Act, 1957** was amended through the **MMDR Amendment Act, 2023**, to introduce a new mineral concession of Exploration Licence for 29 critical and deep-seated minerals to further boost exploration and mining of critical and deep-seated minerals in the country.

About the Critical Minerals:

- **Critical minerals** refer to mineral resources, both primary and processed, which are essential inputs in the production process of an economy, and whose supplies are likely to be disrupted due to the risks of non-availability or unaffordable price spikes.
- Minerals such as **antimony, cobalt, gallium, graphite, lithium, nickel, niobium, and strontium** are among the **22 assessed to be critical for India**.

- Critical and deep-seated minerals such as **Cobalt, Lithium, Nickel, Gold, Silver, and Copper** are difficult to explore and mine as compared to surficial or bulk minerals.
- The exploration license granted through auction shall permit the licensee to undertake reconnaissance and prospecting operations for critical and deep-seated minerals mentioned in the newly inserted **Seventh Schedule to the MMDR Act**.

Minerals can broadly be divided into two categories:

(i) Surficial deposits: minerals such as iron ore, bauxite, limestone, dolomite, manganese, chrome, etc. These minerals are mostly found on surface or shallow depths, although some of them are also worked underground such as manganese and chromite in India and iron ore (Kiruna) in Sweden.

(ii) Deep-seated / concealed deposits: minerals such as gold, lead, zinc, copper, nickel, PGMs, diamond, REE etc. These are mostly deep-seated or concealed but are also worked open cast such as copper in Malanjkhand, gold (super-pit mine) in Western Australia.

Deep-seated minerals such as gold, silver, copper, zinc, lead, nickel, cobalt, platinum group of minerals, diamonds, etc. are high value minerals. It is difficult and expensive to explore and mine these minerals as compared to surficial/ bulk minerals. These minerals are extremely critical for new age electronics, transition to clean energy (solar, wind, electric vehicles) as well as in traditional sectors like infrastructure, defence, etc.

Dahej: Major reason for large semiconductor investments in Gujarat

Section: Economy geography

Context:

- Ashwini Vaishnaw, the Union Minister of Railways, Communications, and Electronics & Information Technology, highlighted the significant **influence of Dahej's large chemical cluster on attracting major semiconductor investments to Gujarat's South-west coast**.

Details:

- The Union Cabinet sanctioned the creation of **three semiconductor units** as part of the **initiative to develop the semiconductor and display manufacturing ecosystems in India**, with construction set to commence within 100 days of approval.
- In June 2023, **Micron** received approval to **establish a semiconductor unit in Sanand, Gujarat**.
- **Tata Electronics**, in collaboration with **Powerchip Semiconductor Manufacturing Corp (PSMC) from Taiwan**, plans to build a **semiconductor fab in Dholera, Gujarat**, investing **₹91,000 crore**. Additionally, **CG Power** will collaborate with **Renesas Electronics Corporation from Japan** and **Stars Microelectronics from Thailand** to create a **semiconductor facility in Sanand, Gujarat**, with a **₹7,600 crore investment**. **Tata Semiconductor Assembly and Test Pvt Ltd** is also set to establish a **semiconductor unit in Morigaon, Assam**, with an investment of **₹27,000 crore**.

Semiconductor manufacturing:

- The **semiconductor manufacturing process** requires nearly **250 speciality gases and chemicals**, which the **Dahej chemical cluster can provide**, making it an **attractive location for semiconductor investments**.
- This has led to a **strategic gravitation** towards areas with established **chemical industries**. The expectations are for the addition of more **fabrication plants and assembly, testing, marking, and packaging (ATMP) units** within the next five years.
- The government's **Semiconductor Mission** aims to establish a comprehensive semiconductor value chain in India, encompassing design, fabrication, ATMP, and leveraging the country's talent pool and resources.
- The inauguration of **Qualcomm's Chennai Design Centre** marks a significant step in completing the **semiconductor ecosystem and value chain in India**.
- Emphasizing the importance of advancing beyond **2G to lead in 5G and 6G technologies**, the role of **Tamil Nadu** as a **talent hub** and the **Qualcomm Design Centre's contribution to semiconductor design** is immense.

Dahej industrial cluster:

- Located in the **Bharuch district of Gujarat** and spread over **76.30 sq. km.**, **Dahej** has potential for **new MSMEs** for sectors like **agro, livestock, forest and demand-based industries**.
- The **major exportable items** include **dyes intermediate and chemicals, bulk drugs and pharmaceuticals**. **Lignite, silica and ball clay** are the major minerals and **black trap, sand, hard murrum and gravel** are the minor minerals found in **Dahej**.

China lithium boom slows as sagging prices batter high-cost miners

Section: Eco geography

Context:

- The **decline in lithium prices**, essential for **electric vehicle (EV) batteries**, is **negatively affecting China's lithium mining industry**, particularly the **mining of lepidolite**, a type of hard rock ore costly to process into lithium.
- Lithium is mined from ores of **petalite** $(\text{LiAl}(\text{Si}_2\text{O}_5)_2)$, **lepidolite** $\text{K}(\text{Li},\text{Al})_3(\text{Al},\text{Si},\text{Rb})_4\text{O}_{10}(\text{F},\text{OH})_2$, **spodumene** $\text{LiAl}(\text{SiO}_3)_2$ and also **subsurface brines**.

Decreased lithium mining in China:

- This trend is due to **decreased EV demand globally**, causing **lithium prices** to drop significantly—over **80%** in the past year according to **Benchmark Mineral Intelligence**.
 - **Benchmark Mineral Intelligence** also known as **Benchmark Minerals**, founded by **Simon Moores** in **2014**, is a **London-based IOSCO-regulated Price Reporting Agency (PRA)** and **specialist information provider** for the **lithium-ion battery to electric vehicle (EV) supply chain**.
- **China**, responsible for about a **quarter of global lithium production in 2023**, is expected to see a substantial impact on its **lepidolite mining operations** due to these **lower prices** and the **high cost of extraction**.
- **Rystad Energy** has significantly **reduced its growth forecast for China's mined lithium output in 2024** to **12%** from an initial **54%**, mainly because of the challenges facing **lepidolite mining**.
- The **cost of processing lithium** from **lepidolite** in **China** is significantly **higher** than from other sources like **brine deposits** and **spodumene**, making **lepidolite mining economically unfeasible** in the current price environment.

Lithium mines in China:

- **China**, ranking **fourth globally in lithium reserves**, has been actively promoting investment to increase its **lithium mining capacity**, aiming to **fulfil the battery sector's demands and reduce import dependency**.
- A significant focus has been on the **southern province of Jiangxi**, known for its recent **lepidolite projects**.
- These projects, such as **CATL's Jianxiawo mine** and **Yongxing's Huashan mine**, have been challenged by the **lower lithium content in kaolinite**, a clay mineral, making production costly at about **1,20,000 yuan per ton of lithium carbonate equivalent (LCE)**.
- **CATL** acquired exploration rights for the **Jianxiawo mine** with an **865 million yuan bid**.

Lithium Production in the World:

- According to the **US Geological Survey (USGS)**, global lithium production in 2019 stood at **77,000 tonnes**.
- **Australia, Chile, China and Argentina** are the world's **top four lithium-producing countries**.
- **Australia** is by far the world's top producer of lithium, with an output of **42,000 tonnes** in 2019.

About lithium

- Lithium is a **non-ferrous metal** and is one of the key components in **EV batteries**.
- It has the symbol **Li** and is a chemical element.
- It's a **silvery-white metal** with a delicate texture.
- It is the **lightest metal and the lightest solid element** under normal circumstances.
- It must be kept in mineral oil since it is very reactive and combustible.
- It is **both an alkali and a rare metal**.

Lepidolite:

- **Lepidolite** is a lilac-gray or rose-colored member of the **mica group of minerals** with the chemical formula $\text{K}(\text{Li},\text{Al})_3(\text{Al},\text{Si},\text{Rb})_4\text{O}_{10}(\text{F},\text{OH})_2$.
- It is the **most abundant lithium-bearing mineral** and is a **secondary source of this metal**. It is the **major source of the alkali metal rubidium**.
- **Lepidolite** is found with other **lithium-bearing minerals**, such as **spodumene**, in **pegmatite bodies**.
- It has also been found in **high-temperature quartz veins, greisens and granite**.

Australia's iron ore miners face falling Chinese demand

Section: Eco geography

Context: Australia's vast iron ore mining sector is facing stark choices as its biggest customer China has likely hit a peak in its steel production and global pressures mount to decarbonise one of the world's most polluting industries.

Details:

- Australia is the world's largest exporter of iron ore, the key raw material used to make steel, and it shipped about 930 million metric tons in 2023, which at current prices would be worth about \$93 billion.
- Australia is also the world's largest exporter of metallurgical coal, used to make steel, ranks second in thermal coal and in liquefied natural gas, while also being the biggest exporter of lithium and largest net exporter of gold.

Why exports falling?

- China's steel output has flattened in the past five years to around 1 billion ton per annum, and most analysts presenting at this week's Global Iron Ore and Steel Outlook Conference in Perth predicted that production will gradually decline in the next few years.
- This is partly because China's infrastructure and housing construction will ease, but also because China will increasingly use scrap steel in electric arc furnaces to produce new steel products

What is the future of Australia Iron Ore industry?

- It's also likely to change in composition, with **higher grades of iron ore** preferred as these can be more easily used as a feedstock along with scrap in electric arc furnaces.
- Higher grades of iron ore can also easily be upgraded into **direct reduction iron (DRI)**, which in turn can be turned into steel without using coal.
- Making steel using DRI produced with green hydrogen and renewable energy is one way the industry is thinking of reducing carbon emissions.
- Even using natural gas to make **DRI can reduce emissions by up to 75%**.
- The problem is DRI is tricky to export given it can be volatile, so it tends to be made at the same location as the steel furnaces.
- So, if Australia's iron ore miners wish to move up the steel value chain, they would must find ways to produce DRI and turn it into steel in Australia, using renewable energy.

Other Option:

- Another path is upgrading the iron ore into **hot briquetted iron (HBI)**, which is an upgraded form of DRI, whereby the DRI is converted into a compact form using heat.
- HBI can be shipped, and can be used in either an electric arc furnace or a basic oxygen unit.

Challenges

- Need significant investment
- No certainty that the upgraded products will deliver sufficiently higher margins.

India's 'protected' basmati varieties renamed & cultivated in Pak, IARI demands legal action

Section: Eco Geography

Context:

- **IARI** has raised concerns about **Pakistan's unauthorized cultivation and marketing of IARI-bred basmati rice varieties**, including **Pusa Basmati-1121, PB-6, PB-1509, PB-1847, PB-1885, and PB-1886**.
- These varieties, accounting for approximately **90%** of **India's basmati exports**, are **protected under Indian law, limiting their cultivation to certain regions within India and restricting seed sales**.
- The **illegal cultivation in Pakistan** undermines the **rights of Indian breeders and farmers**.

Variety Piracy Issues- Specific Varieties and Responses

- **Pakistani seed firms need only a small quantity of seeds to multiply these varieties**, facilitating **illegal propagation**.
- **Pusa Basmati-1121 (PB-1121):** Known for the **extra kernel length of its grains**, officially registered in **Pakistan** as '**PK 1121 Aromatic**' and marketed as '**1121 Kainat**'.
- **Other Varieties:** **PB-6** and **PB-1509** have also been adopted in **Pakistan**, with **PB-1509** being registered as '**Kissan Basmati**'.
 - **Improved Pusa Basmati 1 (Pusa 1460)** - First product of molecular breeding in rice in India.
 - **Pusa Basmati 6 (Pusa 1401)** - Superior grain quality.
 - **Pusa RH10 - The world's first superfine grain aromatic rice hybrid:** It was released in 2001 for commercial cultivation in the irrigated eco-systems of **Haryana, Delhi and Uttaranchal**.

- **Newer Varieties:** IARI's latest varieties like **PB-1847, PB-1885, and PB-1886**, bred for **disease resistance**, are being **grown in Pakistan**, and acknowledged in **YouTube videos** by **Pakistani farms**.

Legal protection for these rice varieties:

- **IARI Director A.K. Singh** has called for **legal measures against Pakistani seed firms** to protect Indian interests.
- **All the varieties** are notified under the **Seeds Act, 1966** for cultivation in the **officially demarcated Geographical Indication area of basmati rice within India**, covering **7 northern states**.
- They are further registered under the **Protection of Plant Varieties and Farmers' Rights Act, 2001**. This Act allows **only Indian farmers to sow, save, re-sow, exchange or share the seeds of any protected/registered varieties**. Even they cannot violate the breeder's rights by selling the seeds in branded packaged and labelled form

India's Basmati Rice Exports:

- Poised to hit a new high, with projections reaching **\$5.5 billion** for **2023-24**, driven largely by **high-yielding varieties** developed by the **Indian Agricultural Research Institute (IARI)**.
- **India dominates markets** in **Iran, Saudi Arabia, and West Asia**, with a **preference for parboiled rice**.
- **Pakistan's Basmati Exports:**
 - **Significantly lower than India's**, with exports valued at **\$694.55 million** in **2021-22** and **\$650.42 million** in **2022-23**.
 - The first seven months of **2023-24** saw a **24.3% increase** in **quantity** and a **35.6%** increase in value over the previous year.
 - **Pakistan enjoys an 85% share** of the **EU-UK market** due to **lower export prices** facilitated by the **depreciation of the Pakistani rupee**.

India in undersea race to mine world's battery metal

Section: Eco Geography

Context:

- **India** is advancing its exploration for **critical minerals** in the **ocean depths** (under **Samudravaan Mission**) to support **renewable energy and clean technology**, amidst increasing global competition.

Key Developments:

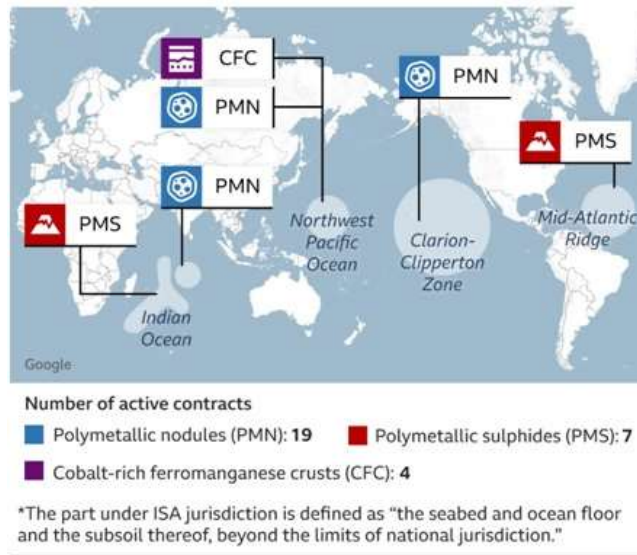
- **India** holds **two licenses** in the **Indian Ocean** and has **applied for two more**, competing with nations like **China** and **Russia** for **essential minerals** such as **cobalt, nickel, copper, and manganese**.
- The **International Seabed Authority (ISA)**, overseeing **deep-sea mineral exploration**, has issued **31 licenses globally**.
- **India's new applications**, if approved, would bring its **total licenses** to nearly match **Russia** and slightly trail **China**.
- **India, China, Germany** and **South Korea** already have **exploration licences** for **polymetallic sulphides** in the **Indian Ocean ridge area**.

Exploration Areas and Challenges:

- **Polymetallic Sulphides:** **India** aims to explore **chimney-like mounds** near **hydrothermal vents** containing **copper, zinc, gold and silver** -in the **Carlsberg Ridge** of the **Central Indian Ocean**.
- Another **aim** is to explore the **cobalt-rich ferromanganese crusts** of the **Afanasy-Nikitin Seamount** in the **Central Indian Ocean**.

Exploration areas for minerals in the international seabed area*

Contracts with the ISA for exploration



Environmental significance:

- **Renewable Energy Goals:** With ambitions to **greatly increase its renewable capacity by 2030** and achieve **net zero emissions by 2070**, India recognizes the necessity of securing critical minerals.
- Despite its potential to offset land mining issues, **deep-sea mining** faces opposition due to **possible environmental harm** and **insufficient understanding of deep marine ecosystems**.

Geopolitical significance:

- The global race for **critical minerals** is intensified by **geopolitical tensions**, especially concerning **China's dominant role in processing these materials**. The **US**, among others, seeks to **diversify supply chains** through partnerships like the **Minerals Security Partnership**, which **India has joined**.
- The **US is not part of the race to mine international waters** as it has **not ratified** the **UN Convention on the Law of the Sea**, the agreement which led to the creation of the **ISA**. Instead, it **aims** to source minerals from its **domestic seabed** and **process ones mined by its allies from international waters**.

Samudrayaan Mission (India's Deep Ocean Mission)

- Samudrayaan, or the journey into the sea, is a **mission launched in 2021** to unlock the mysteries of the deep ocean for mineral resources and develop deep sea technologies for sustainable use of ocean resources.
- A sub-component of India's Deep-Sea Mission, the Samudrayaan mission aimed at supporting the Blue Economy initiatives of the Indian government by developing niche technology, vehicles to carry out subsea activities.
- The **MoES is the nodal ministry** to implement this multi-institutional ambitious mission.
- The estimated cost of the mission will be **Rs 4077 crore for a period of 5 years** to be implemented in a phase-wise manner – cost for the first phase (2021-2024) would be Rs 2823.4 crore.
- **Indian Space Research Organization (ISRO), Indian Institute of Tropical Meteorology (Pune) and Defense Research and Development Organization (DRDO)** will actively participate in this mission.
- It was conceptualized based on the forthcoming **Gaganyaan mission** – ISRO's attempt at a crewed mission into space – **expected in late 2024 or 2025**.

MATSYA 6000

- It is a **manned submersible vehicle developed by NIOT under the Samudrayaan mission** to facilitate humans in the deep ocean in exploring mineral resources like Nickel, Cobalt, Rare Earths, Manganese, etc.
- **Expected to be launched in 2024-25**, it would make **India only one among six countries (US, Russia, Japan, France, and China)** to have piloted a crewed under-sea expedition beyond 5,000 metres.
- **MATSYA-6000 is a spherical, titanium hull (made by ISRO)** equipped with life-support, capable of floating underwater and collecting soil and rock samples from the seabed with attached robotic arms.

Brazil heading to a rare sequence of increasing coffee crop output

Section: Eco Geography

Context:

- **Brazil** is anticipated to mark its **third consecutive year** of **increased coffee production**, a **rare achievement** in its **144-year coffee history**. This trend, mainly fueled by a **boost in robusta bean production**, is expected to continue into **2025**.

Details:

- This sequence of **annual production increases** has been infrequent, occurring **only seven times previously**.
- **Brazil**, traditionally known for **arabica beans** favoured by **premium coffee shops**, is seeing **robust growth** in **robusta production**, commonly used in **instant coffee**.
- Normally, **arabica coffee production** fluctuates annually, but recent **extreme weather events**, including **droughts** and **frosts** around **2020** and **2021**, disrupted this cycle.
- **Post-frost recovery strategies**, such as **pruning** and the **increased use of irrigation**, especially in **robusta cultivation**, have **contributed to the continuous production growth**.
- The **rising trend in robusta output** is expected to **sustain Brazil's overall coffee production growth**, bypassing the **arabica biennial cycle**.
- This ongoing **increase in production** signifies **Brazil's adaptability** and **growing dominance** in the **global coffee market**, with **robusta beans playing a pivotal role**.

Coffee production in India:

- Coffee production in **India** is dominated in the **hill tracts** of **South Indian states**, with **Karnataka** accounting for **71%** (**Kodagu** alone produces **33%** of **India's coffee**), followed by **Kerala** with **21%** and **Tamil Nadu** (**5%** of overall production with **8,200 tonnes**).
- **Indian coffee** is said to be the **finest coffee** grown in the shade rather than in direct sunlight anywhere in the world.
- Almost **80%** of Indian coffee is **exported**.

Coffea arabica:

- A species of **flowering plant** in the **coffee and madder family Rubiaceae**.
- Believed to be the **first species of coffee** to have been **cultivated** and is currently the **dominant cultivar**, representing about **60% of global production**.
- Coffee produced from the **less acidic, more bitter, and more highly caffeinated robusta bean (C. canephora)** makes up most of the remaining coffee production.
- **Endemic to the southwestern highlands of Ethiopia**, **Coffea arabica** is today grown in dozens of countries between the **Tropic of Capricorn** and the **Tropic of Cancer**.
- The **natural populations of Coffea arabica** are **restricted to the forests of South Ethiopia and Yemen**.

Coffea canephora (or robusta coffee):

- A species of **flowering plant** in the **family Rubiaceae**.
- A species of **coffee plant** that has its **origins in central and western sub-Saharan Africa**.
- **Coffea canephora** has two main varieties- **robusta** and **nganda**.
- Grows indigenously in **Western and Central Africa** from **Liberia to Tanzania** and **south to Angola**.

Difference between Robusta and Arabica coffee:

- Beans from **C. robusta** tend to have **lower acidity, more bitterness**, and a **more woody and less fruity flavour** compared to **C. arabica** beans.
- A **greater crop yield** than that of **arabica**,
- Contains **more caffeine** (2.7% compared to arabica's 1.5%),
- contains **less sugar** (3—7% compared to arabica's 6—9%).
- As it is **less susceptible to pests and disease**, **robusta** needs **much less herbicide** and **pesticide** than **arabica**.

India's 'protected' basmati varieties renamed & cultivated in Pak, IARI demands legal action

Section: Eco geography

Context:

- **IARI** has raised concerns about **Pakistan's unauthorized cultivation and marketing** of **IARI-bred basmati rice varieties**, including **Pusa Basmati-1121, PB-6, PB-1509, PB-1847, PB-1885, and PB-1886**.
- These varieties, accounting for approximately **90%** of **India's basmati exports**, are **protected under Indian law**, limiting their cultivation to certain regions within India and restricting seed sales.
- The **illegal cultivation in Pakistan** undermines the **rights of Indian breeders and farmers**.

Variety Piracy Issues- Specific Varieties and Responses

- **Pakistani seed firms** need only a small quantity of seeds to multiply these varieties, facilitating **illegal propagation**.
- **Pusa Basmati-1121 (PB-1121)**: Known for the **extra kernel length of its grains**, officially registered in **Pakistan** as '**PK 1121 Aromatic**' and marketed as '**1121 Kainat**'.
- **Other Varieties: PB-6 and PB-1509** have also been adopted in **Pakistan**, with **PB-1509** being registered as '**Kissan Basmati**'.
 - **Improved Pusa Basmati 1 (Pusa 1460)** - First product of molecular breeding in rice in India.
 - **Pusa Basmati 6 (Pusa 1401)** - Superior grain quality.
 - **Pusa RH10 - The world's first superfine grain aromatic rice hybrid**: It was released in 2001 for commercial cultivation in the irrigated eco-systems of

Haryana, Delhi and Uttaranchal.

- **Newer Varieties: IARI's** latest varieties like **PB-1847, PB-1885, and PB-1886**, bred for **disease resistance**, are being grown in **Pakistan**, and acknowledged in **YouTube videos** by **Pakistani farms**.

Legal protection for these rice varieties:

- **IARI Director A.K. Singh** has called for **legal measures against Pakistani seed firms** to protect Indian interests.
- **All the varieties** are notified under the **Seeds Act, 1966** for cultivation in the **officially demarcated Geographical Indication area of basmati rice within India**, covering **7 northern states**.
- They are further registered under the **Protection of Plant Varieties and Farmers' Rights Act, 2001**. This Act allows **only Indian farmers to sow, save, re-sow, exchange or share the seeds of any protected/registered varieties**. Even they cannot violate the breeder's rights by selling the seeds in branded packaged and labelled form

India's Basmati Rice Exports:

- Poised to hit a new high, with projections reaching **\$5.5 billion** for **2023-24**, driven largely by **high-yielding varieties** developed by the **Indian Agricultural Research Institute (IARI)**.
- **India dominates markets** in **Iran, Saudi Arabia, and West Asia**, with a preference for **parboiled rice**.
- **Pakistan's Basmati Exports:**
 - **Significantly lower than India's**, with exports valued at **\$694.55 million** in **2021-22** and **\$650.42 million** in **2022-23**.
 - The first seven months of **2023-24** saw a **24.3% increase** in quantity and a **35.6%** increase in value over the previous year.
 - **Pakistan** enjoys an **85%** share of the **EU-UK market** due to **lower export prices** facilitated by the **depreciation of the Pakistani rupee**.

Robusta coffee price touches all-time high amid global shortage

Section: Eco Geography

Context: Robusta coffee farmers in South India are jubilant post-harvest with their produce fetching an all-time high price.

Reasons for high price

- Decline of 30% in Robusta production this year owing to climatic vagaries, especially the scanty blossom shower in Robusta-growing regions last year. Wayanad in Kerala, which is the largest Robusta coffee-producing district in the country after Coorg in Karnataka, received a rainfall of 29.3 mm in the first week of January. Major parts of the district received no rain since then
- A sharp decline in the production of Robusta coffee—nearly 2 million bags— in Vietnam, a major Robusta coffee-growing country, has also led to the rise in prices

Total Coffee production in India

According to the Coffee Board of India, the total production of coffee in India during the 2022-23 fiscal was 3,52,000 tonnes, including 2,52,000 tonnes of Robusta coffee. The total value of India's coffee exports has risen to ₹5,279 crore during the ongoing coffee season, from ₹3,982 crore during the same period in the earlier season

Geographical Conditions

- Coffee plant requires hot and humid climate with temperatures ranging between 15°C and 28 °C and rainfall from 150 to 250 cm.
- Frost, snowfall, high temperature above 30°C and strong sun shine is not good for coffee crop and is generally grown under shady trees.
- Dry weather is necessary at the time of ripening of the berries.
- Stagnant water is harmful and the crop is grown on hill slopes at elevations from 600 to 1,600 metres above sea level.
- Well drained, loams containing good deal of humus and minerals like iron and calcium are ideal for coffee cultivation.

Blossom Shower:

- Pre-monsoon showers are the key to plantation crops such as tea, rubber, coffee, pepper and cardamom in South India. However Coffee varieties like **Arabica** coffee needs 90-120 days stress period and **robusta** about 60 days to blossom. But the rains every month since December have left the lands with moisture and vegetative growth preventing reproductive growth.
- Frequent rains will also help pepper catkins to gain weight, though new ones may not appear until the plants undergo a stress period.

About Pre-Monsoon shower

- Pre-monsoon shower or summer rain is formed due to the storm over the Bay of Bengal.
- It is a mixture of dry and moist winds. It at times gives rise to local storms, such as the occurrence of violent winds, heavy rain and hailstorms.
- These showers' effect can be seen in two ways such as in some states of northern India it reduces the intensity of heat waves, but it also come with the blessing of showers in the Eastern and Southern India for the farmers.
- Different names of pre-monsoon shower
 1. Tea Shower in Assam
 2. Kalbaishakh in West Bengal
 3. Mango Shower in Kerala and Coastal areas of Karnataka
 4. Cherry Blossoms/ Coffee showers in Kerala and some part of Karanataka

Geographical Distribution

- In India, coffee is cultivated in about 4.54 lakh hectares by 3.66 lakh coffee farmers of which 98% are small farmers.
- **The cultivation is mainly done in the Southern States of India:**
 - **Karnataka – 54%**
 - **Kerala – 19%**
 - **Tamil Nadu – 8%**
- It is also grown in non-traditional areas like **Andhra Pradesh and Odisha (17.2%)** and **North East States (1.8%)**.
- India is the only country in the world where the entire coffee cultivation is grown under shade, hand-picked and sun dried.
- India produces some of the best coffee in the world, grown by tribal farmers in the Western and Eastern Ghats, which are the two major biodiversity hotspots in the world.
- Indian coffee is highly valued in the world market and is sold as premium coffee in Europe.
- India ranks 6th among the world's 80 coffee producing countries, with some of the finest robusta and some top-notch arabica cultivated.
- Nearly 70% of India's coffee is exported, largely to European and Asian markets.
- Coffee in India is traditionally grown in the rainforests of the Western Ghats in South India, **covering Chikmagalur, Kodagu (Coorg), Wayanad, the Shevaroy Hills and the Nilgiris.**

India cultivates all of its coffee under a well-defined two-tier mixed shade canopy, comprising evergreen leguminous trees. Nearly 50 different types of shade trees are found in coffee plantations. Shade trees prevent soil erosion on a sloping terrain; they enrich the soil by recycling nutrients from deeper layers, protect the coffee plant from seasonal fluctuations in temperature, and play host to diverse flora and fauna.

Coffee plantations in India are essential spice worlds too: a wide variety of spices and fruit crops like pepper, cardamom, vanilla, orange and banana grow alongside coffee plants.

India's coffee growing regions have diverse climatic conditions, which are well suited for cultivation of different varieties of coffee. Some regions with high elevations are ideally suited for growing **Arabicas** of mild quality while those with warm humid conditions are best suited for **Robustas**.

Factors	Arabica	Robusta
Soils	Deep, fertile, rich in organic matter, well drained and slightly acidic (pH 6.0-6.5)	Same as Arabica
Slopes	Gentle to moderate slopes	Gentle slopes to fairly level fields
Elevation	1000-1500m	500-1000m
Aspect	North, East and North- East aspects	Same as Arabica
Temperature	15°C – 25°C ; cool, equable	20°C – 30°C, hot, humid
Relative humidity	70-80%	80-90%
Annual rainfall	1600-2500 mm	1000-2000 mm
Blossom showers	March-April (25-40mm)	February – March (25-40 mm)
Backing showers	April-May (50-75 mm) well distributed	March-April (50-75 mm) well distributed

About Coffee Board:

- The Government of India established the 'Coffee Board' through a **constitutional act "Coffee Act VII of 1942"**
- Until 1995 the Coffee Board marketed the coffee of a pooled supply. Later, coffee marketing became a private-sector activity due to the economic liberalisation in India.
- It is under the administrative control of **Ministry of Commerce and Industry**.
- The Board comprises **33 members** including the Chairman, who is the Chief Executive and appointed by the Government of India.
- **Role of Coffee Board:** Coffee Board serves as the **friend, philosopher and guide to the Coffee sector** covering the entire value chain. The core activities are primarily directed towards **research & development, transfer of technology, enhancement of production, quality improvement, export promotion and supporting development of Domestic market**.
- The head office of the **Coffee Board is situated in Bangalore**.
- International Coffee Day is on **1st October**.

Sensing China threat, India joins race to mine new sea patch

Section: Eco geography

Context:

- **India** has submitted an application to the **International Seabed Authority (ISBA)**, based in **Jamaica**, to **explore two large areas** of the seabed in the **Indian Ocean outside its territorial waters**.

Afanasy Nikitin Seamount (AN Seamount):

- Specifically, **India** is interested in the **Afanasy Nikitin Seamount (AN Seamount)**, a **cobalt-rich area** that has already been **claimed by Sri Lanka** under different legal frameworks.
- This move by India is partly **influenced by reports of Chinese vessels conducting reconnaissance in the same region**.
- The **AN Seamount**, a significant **geological structure** in the **Central Indian Basin**, is **located approximately 3,000 km from India's coastline**.
- It spans **400 km in length** and **150 km in width**, rising from an **oceanic depth** of about **4,800 meters** to **1,200 meters above the seabed**.
- This area is known for its **rich deposits of cobalt, nickel, manganese, and copper**, identified through surveys conducted around two decades ago.

Process of obtaining exploration rights:

- For any extraction activities to commence, countries must first obtain an **exploration license from the ISBA**, an **autonomous international organization** created under the **United Nations Convention on the Law of the Sea (UNCLOS)**.
- These **rights are specific to areas** that are part of the **open ocean**, meaning **ocean** — whose **air, surface and sea-bed** — where **no countries can claim sovereignty**.
- Around **60% of the world's seas are open ocean** and though believed to be rich in a **variety of mineral wealth**, the **costs and challenges of extraction are prohibitive**.

- **Currently no country has commercially extracted resources from open oceans.**
- Another UNCLOS-linked body, the **Commission on the Limits of the Continental Shelf**, which **decides on the limits of a country's continental shelf**, may **impede India's exploration ambitions.**

Exclusive rights:

- **Countries possess exclusive rights to the sea and seabed up to 200 nautical miles from their borders**, extending this claim to the **continental shelf** if it **naturally stretches beyond this limit**, requiring detailed scientific proof.
- **Claims to the continental shelf usually don't exceed 350 nautical miles**, but an **exception allows Bay of Bengal countries**, like **Sri Lanka**, to claim **up to 500 nautical miles**, pending approval.
- **India's interest in exploring the Afanasy Nikitin Seamount (AN Seamount)** and another area in the **Central Indian Ocean** is driven by **strategic concerns**, including the **presence of Chinese vessels** in these regions.
- Any area not recognized as part of a country's continental shelf is considered **'high sea'** and **open for exploration applications** to the **International Seabed Authority (ISBA)**.

India's claim:

- The **ISBA**, upon reviewing **India's application to explore a cobalt-rich area already claimed by Sri Lanka**, requested **India** to comment on the overlapping claim.
- A **high-level Indian delegation** presented scientific evidence to support its claim for **exploration rights**, with the **ISBA** asking for further clarifications.
- A **final decision** is awaited later this year. **India** has also **sought permission to explore the Carlsberg Ridge for polymetallic sulphides**, indicating its active interest in the **Central Indian Ocean's resources**.
- Despite having staked a claim for its **continental shelf up to 350 nautical miles** and previously gaining exploration rights in other regions, India awaits formal approval for its recent applications.

What is the economic cost of Baltimore's bridge collapse?

Section: Eco Geography

Context:

- The **Baltimore port's** closure could cost the economy \$15m per day while insurers face up to \$3bn in claims.

More on news:

- The collapse of a **major bridge in Baltimore earlier** this week has led to the **suspension of vessel traffic at the Port of Baltimore, one of the busiest harbors in the United States.**
- Attacks on the **Red Sea by Yemen's Houthi group** have reduced traffic traveling through the Suez Canal, through which some 15 percent of the world's shipping traffic passes.
- **The Panama Canal, which handles 6 percent of the world's maritime commerce**, is experiencing decreasing water levels, reducing the canal's capacity

About Baltimore bridge:

- The **Francis Scott Key Bridge** was a steel arch continuous through a truss bridge that spanned the lower **Patapsco River and outer Baltimore Harbor / Port.**
- Ports in **Philadelphia, Wilmington, Delaware; Newark, New Jersey; Norfolk; Charleston, South Carolina; Jacksonville, Florida; and Georgia (Savannah and Brunswick)** also could see additional cargo.

Why is Port important?

- The **Port of Baltimore is the ninth largest US port in terms of overall trade volume.**
- It handles cargo including automobiles, machinery, agricultural equipment, liquefied natural gas and sugar.
- The port processed 847,158 automobiles last year, according to figures from the state of Maryland. About 70 percent of these were imported.

Key Bridge in Baltimore collapses after ship collision

A container ship, the Dali, crashed into a 1.6-mile (2.57 km) bridge in Baltimore, Maryland on March 26, causing it to collapse and sending cars and people plunging into the river below.



Star dunes

Section: Geomorphology

Context: Scientist unveiled the first in depth study of star dune, revealing the internal structure of these geological features and showing how long it took for one of them to form

What are star dunes?

- Star dunes - or pyramid dunes - are named after their distinctive shapes and reach hundreds of metres in height.
- Star dunes make up just under 10% of the dunes in Earth's deserts. These are the tallest ones, surpassing other types such as crescent-shaped barchan dunes and straight and lengthy linear dunes.
- These are formed in areas with complex wind regimes, where winds blowing from different directions and net sand accumulation, points within the desert where big piles of sand can be blown around to form giant dunes.

Geographical distribution:

- They are found in Africa, Asia and North America and also have been spotted on Mars and on Saturn's large moon Titan.
- Earth's largest star dunes are found in the Badain Jaran desert in western China.
- Namib Sand Sea in Namibia, large sand seas in Algeria such as the Grand Erg Oriental and Grand Erg Occidental, and Rub' al Khali in Saudi Arabia.
- In North America, Great Sand Dunes National Park in Colorado contains a series of them.

Recent study about Star dunes

- The research team from the UK have estimated the age of star dune of Lala Lallia in Morocco, for the first time.
- The scientists used a technique called luminescence dating to work out the age of the star dune. The method calculates when the grains of sand were last exposed to daylight.

Types of dunes

Barchans: – crescent-shaped sand dune produced by the action of wind predominately from one direction.

One of the most common types of dunes, it occurs in sandy deserts all over the world.

Barchans are convex facing the wind, with the horns of the crescent pointing downwind and marking the lateral advancement of the sand.

These dunes are markedly asymmetrical in cross section, with a gentle slope facing toward the wind and a much steeper slope, known as the slip face, facing away from the wind.

Parabolic

Parabolic dunes – also called U-shaped, blowout, or hairpin dunes – tend to form where vegetation covers the sand. Winds may erode a section, pushing the sediment leeward. The vegetation will hold back the arms of the dune, so that the dune points in the leeward direction. The animation below gives a basic overview of how they form. They are most common in coastal deserts. Sometimes, parabolic dunes can come from transverse or barchan dunes, given that the dunes stay static enough for vegetation to grow on them.

Star

Star dunes are a rare, interesting dune structure, that pepper landscapes in sandy deserts. They form when alternating and multiple wind directions pile sand in a location, and forms a peak, with many arms extending from the center (Fun Facts...). Star dunes make up 8.5% of all the dunes on the planet, and they often form in large groups in a dune field (Star Dunes). Many of these fascinating dunes can be seen in the Sahara desert, especially in the Grand Erg Oriental, a "sand sea" of dunes.

Barchan

Barchan dunes are crescent or half-moon shaped, and are thus also called crescentic dunes. They form where conditions are ideal. They require a flat landscape, winds from only one direction, and limited sand. However, these exact conditions are rare, and so is this type of dune, although they are found in all types of deserts. Barchan dunes point against the wind. Their faces are steep, but their trailing sides are not. They will often join up with other barchans to form barchanoid ridges.

Longitudinal

Also called linear dunes, longitudinal dunes look like large, parallel needle-esque features on the landscape. They are straight, and long, unlike the typical dune that people imagine. This dune type forms when sand is not in excess, and when wind blows in one constant direction. Over an extended period of time the dunes will migrate in the direction the wind is blowing.

Indigenous Greenland women sue Denmark over forced contraception

Section: Human geography

Context:

- In **Greenland**, **143 Indigenous Inuit women** have filed a **lawsuit** against **Denmark**, demanding compensation of nearly **43 million kroner (\$6.3 million)** for being **forcibly fitted with intrauterine contraceptive devices (IUDs)** during the **1960s and 70s**.

Details:

- These women, some of whom were teenagers at the time, allege that **Danish health authorities** violated their **human rights** by **inserting these devices without their awareness or consent, aiming to curb population growth in Greenland amidst improving living conditions and healthcare**.
- Although **Greenland** transitioned from a **Danish colony** to a province in **1953**, the matter has prompted a joint investigation by the **governments of Denmark and Greenland**, with findings expected next year.

About Intrauterine Contraceptive Devices (ICD):

- An **IUD** is a **small T-shaped plastic and copper device** that's put into one's **womb (uterus)** by a doctor or nurse.
- It releases **copper** to stop one **getting pregnant**, and **protects against pregnancy for between 5 and 10 years**. It's sometimes called a "**coil**" or "**copper coil**".

Uses, advantages and disadvantages:

- When inserted correctly, IUDs are more than **99% effective**.
- An **IUD works** as soon as it's put in and **lasts for 5 to 10 years**, depending on the type.
- It can be put in at any time during one's **menstrual cycle**, as long as **one is not pregnant**.
- It can be **taken out at any time** by a specially trained doctor or nurse. **It's then possible to get pregnant straight away**.
- There's a **small risk of getting an infection** after it's been fitted.
- There's a small risk that one's body may push out the IUD or it may move.
- **It may not be suitable** if one has had previous pelvic infections.
- **It does not protect against sexually transmitted infections (STIs)**.

About Greenland:

- **Greenland** is a **North American autonomous territory** of the **Kingdom of Denmark**.
- It is the **larger of two autonomous territories** within the Kingdom, the other being the **Faroe Islands**; the citizens of both territories are **full citizens of Denmark**.
- As **Greenland** is one of the **Overseas Countries and Territories of the European Union**, citizens of **Greenland** are **European Union citizens**.
- The **capital and largest city of Greenland** is **Nuuk**.
- **Greenland** lies between the **Arctic and Atlantic oceans**, east of the **Canadian Arctic Archipelago**.

- It is the **world's largest island**, and is the location of the **northernmost area of the world** – **Kaffeklubben Island** off the **northern coast** is the **world's northernmost undisputed point of land**, and **Cape Morris Jesup** on the **mainland** was thought to be so until the **1960s**.

A tribe in the Western Ghats in need of a lifeline

Section: Human Geography

Context:

- The **Makuta village** houses a **Girijan colony** inhabited by the '**Phani Yerava**' tribe. In **2021**, with local assistance, **all 19 Yerava households successfully claimed forest land rights** under the **Forest Rights Act**, covering **135 acres** historically occupied by their ancestors.

Details:

- The **Makuta village** is in the **Western Ghats' Kodagu district, Karnataka**, part of the **Talacauvery sub-cluster** and is **one of the 10 World Heritage Sites in Karnataka**. This area is known for its **dense tropical evergreen forests**.
- The findings are part of a larger research study titled "**Tribals, Forest Rights and Heritage Conservation: A Study of Western Ghats in Karnataka**," sponsored by the **Indian Council of Social Science Research, New Delhi**.
- The study suggests a need for **targeted policies to support tribal communities** facing **socio-economic hardships and addiction problems**, advocating for a holistic approach to improving their quality of life.

Key findings:

- Despite obtaining **forest rights**, the **tribe's enthusiasm** is dampened by the diminishing returns and increasing hardships of **forest-dependent livelihoods**.
- The **tribal community** now **primarily engages in daily labour**, often travelling to nearby **Kasaragod, Kerala**, for work due to better wages and language comfort.
- While still **collecting minor forest produce** like **fuelwood, honey, dhoopa (incense), and shekakai (soap pod)**, most of it is for personal consumption without stockpiling, indicating a shift away from the **traditional forest-based economy**.

About Forest Rights Act, 2006:

- The Forest Rights Act (FRA), 2006 recognizes the rights of the **forest-dwelling tribal communities and other traditional forest dwellers to forest resources, on which these communities were dependent for a variety of needs, including livelihood, habitation and other socio-cultural needs**.

Objectives:

- To undo the **historical injustice** that occurred to the forest-dwelling communities.
- To **ensure land tenure, livelihood and food security of the forest-dwelling Scheduled Tribes and other traditional forest dwellers**.
- To **strengthen the conservation regime** of the forests by including the responsibilities and authority of Forest Rights holders for sustainable use, conservation of biodiversity and maintenance of ecological balance.

What Rights Do Forest Dwellers Get Under the Act?

- The Forest Rights Act, of 2006 recognises **three types of Rights**:
 1. **Land Rights:**
 - The Act gives the forest dwellers the right to ownership land farmed by them, subject to a **maximum of 4 hectares per family**.
 - Ownership is only for land that is actually being cultivated by the concerned family and no new lands can be granted.
 - The land cannot be sold or transferred to anyone except by inheritance.
 2. **Use Rights:**
 - The rights of the dwellers extend to extracting **Minor Forest Produce** (such as tendu patta, herbs, medicinal plants etc.), grazing areas, to pastoralist routes, etc.
 - Minor forest produce **does not include timber**.
 3. **Right to Protect and Conserve:**
 - The Act gives the forest-dwelling communities the right to protect and manage the forest.
 - This is vital for the thousands of village communities protecting their forests and wildlife against threats from forest mafias, industries and land grabbers.

Who Can Claim These Rights?

- Members or community of the Scheduled Tribes who primarily reside in and who depend on the forests or forest lands for bonafide livelihood needs.
- It can also be claimed by any member or community who has **for at least three generations (75 years) before 13th December 2005** primarily resided in forest land for bona fide livelihood needs.

How Are These Rights Recognised?

- **Section 6 of the Forest Rights Act, 2006** provides a transparent three-step procedure for deciding on who gets rights:
- **Step-1:** Gram Sabha makes a recommendation – i.e. who has been cultivating land for how long, which minor forest produce to be collected, etc.
- **Step-2:** The Gram Sabha's recommendation goes through two stages of screening committees at the Taluka and District levels.
- **Step-3:** The District Level Committee makes the final decision. The committees have six members – three government officers and three elected persons.

Where names indicate the order of birth in a family

Section: Human geography

Context:

- In the **Lisu** or **Yobin community** of **Arunachal Pradesh, India**, the **naming convention reflects the birth order of children**.
- This unique naming practice is a significant aspect of their **culture**, underlining the importance of family and tradition within the **Lisu community**.
- Recently, Birdwatchers have discovered a new species of **wren babblers (bird)** in **remote northeastern Arunachal Pradesh** which has been named as **Lisu wren babbler**.

Details:

- For instance, the eldest daughter's name includes "**Ana**," while subsequent daughters are named "**Angyi**," "**Acha**," and so forth up to "**Apshi**" for the tenth daughter.
- Boys' names follow a similar pattern, with "**Apu**" for the eldest and names like "**Adu**," "**Akhi**," continuing in order.
- To avoid confusion in cases where multiple families might have children with similar naming patterns due to their birth order, the **Lisu** employ a system of **prefixes or suffixes**.
- This customization adds uniqueness to each name, reflecting both the **individual's birth order** and **potentially their clan affiliation**.
- Clan names such as **Ngwazah**, **Jeazah**, and **Michey**, among others, are examples of this practice.
- This system of naming not only signifies the individual's position in their family but also connects them to their broader cultural heritage and community identity.

Lisu and Singpho communities:

- The **Lisu** and **Singpho communities**, part of the **Tibeto-Burman ethnic family**, share the **tradition of using numbered names to indicate birth order within their families**, reflecting their **ethnic bonds** and **cultural heritage**.
- This naming convention is prevalent among the **Lisus**, who are spread across **Arunachal Pradesh, China, Myanmar, and Thailand**, and the **Singphos**, found in **27 countries**, including significant populations in **India's Arunachal Pradesh** and **Assam**.
- Both communities use **specific sequences of names for boys and girls**, with additional practices to avoid confusion in cases of similar name counts within families.
- These practices can **include prefixing or suffixing given names**.
- Moreover, **names** can also include **clan or ancestral references**, further enriching the **cultural and familial significance of the naming convention**.
- This system underscores the communities' **deep-rooted traditions and the importance of family and clan identities**.

About Wren Babblers:

- **Babbler family:** There are about 20 species of **small Asian birds** belonging to the babbler family **Timaliidae**.
- **Features:**
 - They are 10 to 15 centimetres (4 to 6 inches) long, **short-tailed** and have a rather **short and straight bill**.
- **Habitat:** Wren-babblers occur chiefly in **southern Asia**.
- **Grey-bellied wren babblers:** Which are almost similar to this new species are found mostly in **Myanmar** and in smaller numbers in **China** and **Thailand**.

India's birth crisis: What the Lancet forecast of fertility rate dip to 1.29 by 2050 means

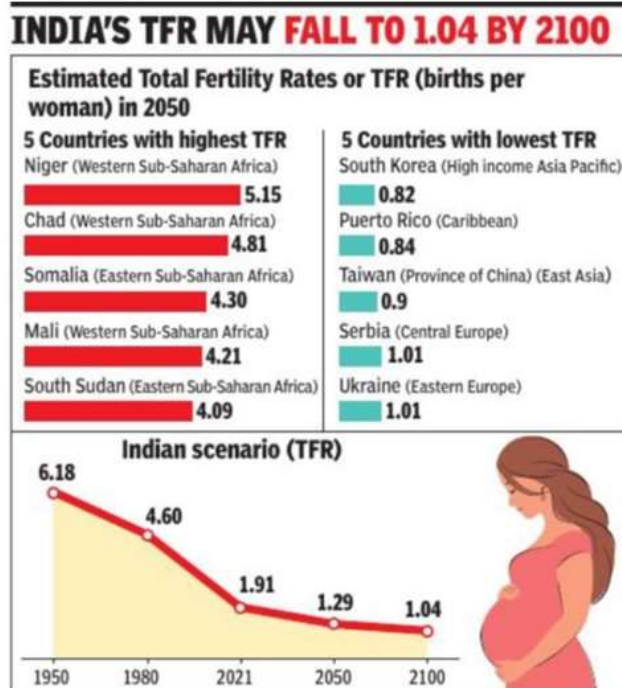
Section: Human Geo

Context:

- A recent study published in The Lancet warns that India's total fertility rate (TFR), or births per woman, will fall to 1.29 by 2050.

More on news:

- By 2050, one in five Indians will be a senior citizen while there will be fewer younger people to take care of them.
- **India's total fertility rate (TFR)** — the average number of children born per woman — is dipping irreversibly to 1.29, far lower than the replacement rate of 2.1.
- This means a **rapidly depleting working age population**.
- About **Global Burden of Disease, Injuries and Risk Factors Study (GBD)-2021**:
- As per research estimates from the **Global Burden of Disease, Injuries and Risk Factors Study (GBD)-2021**, worldwide, too, the **TFR has more than halved in the last 70 years – from around five children for each woman in 1950 to 2.2 children in 2021**.
- In India, the **TFR was 6.18 in 1950 which reduced to 4.60 in 1980 and further declined to 1.91 in 2021**.
- China is already dealing with the demographic disadvantage of an aging population.
- Both India and China together account for more than a third of the world's population.
- **Total Fertility rate:** The total fertility rate in a specific year is defined as the total number of children that would be born to each woman if she were to live to the end of her child-bearing years and give birth to children in alignment with the prevailing age-specific fertility rates.



Why fertility went down in India

- Post-independence, there was a need to restrict the population.
- So the **Family Welfare Programme**, including maternal and child health-related cash transfer inducements, were intended to convince people to have no more than two children.
- Slowly that **behavior change started showing up**.
- **Infant mortality declined substantially** (because of various maternal and child health-related programmes and successful immunization) meaning child survival was guaranteed.
- With development, **the intergenerational flow of wealth has reversed**.

- This means **parents now do not receive much benefit from their children the way they used to**. This has influenced their decision to have an additional child that would involve a substantial cost of bringing them up.
- The other **significant factor has clearly** been the rise of female literacy and women's participation in the workforce.
- **Career consciousness, financial returns and economic independence** have meant that women are reconsidering their options of having a second child.
- In the urban space, **many women do not consider child-rearing as a must-do task**, instead choosing not to have babies at all and even considering options like adoption.
- This pattern is **percolating to rural India too**.

What are long-term consequences?

- The consequences of fertility decline will be that the share of the **elderly in the population will increase sharply**.
- By 2050 the share of senior citizens in **India will be more than 20 per cent, that is one five people**.
- Challenges like labor force shortages and potential social imbalances due to gender preferences are likely to occur.

Declining trend worldwide

- Researchers estimate that by 2050, **155 of 204 countries (76 percent of the world)** will be below the replacement level of fertility.
- The number of countries and territories below replacement level is predicted to **further increase to 198 (97 per cent) by 2100**.

National dam panel to examine Kaleshwaram project on March 6

Section: Indian physical geography

Context:

- The **National Dam Safety Authority (NDSA)** has established an **expert committee** to **investigate** the **Kaleshwaram Lift Irrigation Project (KLIP)** following concerns over the **sinking of piers** at the **Medigadda barrage**.

Details:

- This inspection is scheduled due to issues at the **Medigadda barrage, Sundilla and Annaram barrages**.
- The **NDSA's five-member committee**, led by **J. Chandrasekhar Iyer**, a former chairman of the **Central Water Commission (CWC)**, will conduct a comprehensive review.

Madigadda barrage:

- The **Lakshmi Barrage**, also known as the **Medigadda Barrage** is the starting point of the **Kaleshwaram Project** which envisages the construction of **three barrages** between **Yellampally & Medigadda**.
- Its **objective** is to utilize **Godavari** water for drinking and irrigation. The Barrage/Project site is located at **Medigadda Village, Mahadevpur Mandal, Jayashankar Bhupalpally district in Telangana State, India**.

Kaleshwaram lift- irrigation project:

- It is a **multi-purpose irrigation project** on the **Godavari River** in **Kaleshwaram, Bhupalpally, Telangana**.
- The project starts at the confluence point of the **Pranahita River** and **Godavari River**.
- Originally called the **Pranahita-Chevella project** in erstwhile **Andhra Pradesh**, it was redesigned, extended and renamed as the **Kaleshwaram project** in **Telangana** in **2014**.
- **Need of the project:**
 - It would bring **drinking water and irrigation** to the **backward areas of Telangana**.
 - It will also help to restore the **groundwater level** to its original state by the way of shifting from the usage of groundwater for irrigation to the usage of surface water.
 - The project will also support **Mission Kakatiya** and **Mission Bhagiratha** schemes designed to provide drinking water to many villages and improve the capacities of tanks.

National Dam Safety Authority (NDSA):

- The **Dam Safety Act 2021** was introduced in response to dam failures caused by deficient surveillance and maintenance.
- It establishes **key responsibilities** and requires the formation of national and state-level bodies for its implementation.
- **The Act outlines the following provisions:**
 - **National Committee on Dam Safety:** Responsible for overseeing dam safety policies and regulations.
 - **National Dam Safety Authority:** Tasked with implementing and resolving state-level disputes.

- **Chairman of the Central Water Commission (CWC):** Heads dam safety protocols at the national level.
- **State Committee on Dam Safety (SCDS) and State Dam Safety Organisation (SDSO):** To be established at the state level.

Water crisis in Bengaluru linked to urbanization of Kodagu

Section: Indian Physical geography

Context:

- The **Save Kodagu and Cauvery Campaign** has raised concerns about the **adverse effects of rampant commercial land conversion and urbanisation in Kodagu**, the birthplace of the **Cauvery River**.

Save Kodagu and Cauvery Campaign:

- **Aim:**
 - This **campaign** highlights the **critical role of Kodagu** as the **principal catchment area** for the **Cauvery**, which significantly contributes to the **water supply of Bengaluru**.
 - The **Save Kodagu and Cauvery Campaign's** concerns underscore the need for **sustainable development policies** to preserve the **Cauvery's water supply** for **Bengaluru** and other dependent regions.
- **Cause of water crisis:**
 - The **continued urban expansion** and **environmental degradation** in **Kodagu** could lead to a **scenario** where the **district's cities grow significantly**, potentially affecting the water supply to **Bengaluru** and neighbouring regions.
- **Consequences:**
 - The **campaign** highlighted the **potential long-term consequences of unchecked urbanisation** in **Kodagu**, such as the **transformation of several areas into large urban centers** and the **possible escalation of the population**.
 - Such developments could **strain water resources**, requiring **drastic measures** like invoking the **National Disaster Act** in the event of **drought conditions**.
 - This could **severely impact local agriculture**, particularly **coffee production**, by **restricting water usage for irrigation**.

Kodagu- Place of origin of Cauvery river:

- **Kodagu**, which is the **main catchment area** as well as **place of origin of the Cauvery river**, is under stress due to the sensitive ecosystem.
- Located in the **Western Ghats region of Karnataka**.
- The **Krishnaraja Sagar (KRS) reservoir** is located downstream the **Cauvery river**.



Water levels less than 25% in many major dams in the south

Section: Indian Physical geography

Context:

- Most of the **major reservoirs** in the **southern States of Karnataka, Tamil Nadu, Andhra Pradesh, and Telangana** are filled to **only 25% of their capacity or less**.

Details:

- Some **large dams** such as the **Tungabhadra** in **Karnataka** and the **Nagarjuna Sagar** on the **Andhra Pradesh-Telangana border** are filled to **5% or less of their full capacity**.

- **Other large dams** such as **Mettur** in **Tamil Nadu** and **Srisaillam** on the **Andhra Pradesh-Telangana border** are also filled to **less than 30%** of their capacity.
- Across **India**, the **current water level** in **150 primary reservoirs** put together as a share of their **total capacity stood at 38%**.
- All the reservoirs put together are filled to **only 23%** of their capacity in this region, which is about **17% points lower** than the levels recorded last year and **9 points lower** than the **10-year average**.
- **Status of reservoirs of other region:**
 - No other region - **central, west, east, or north** - shows such a drastic difference in levels compared to last year as well as the **10-year average**.
 - In the **northern and central regions**, the **reservoirs** are filled to **33%** and **46%** of their **capacities**, respectively, similar to the **10-year average levels** recorded in those regions.
 - In the **western region**, the reservoirs are filled to **45%** of their **capacity**, **slightly higher than their 10-year average**, while the **49%** recorded in the **eastern region** was **only marginally lower than the 10-year average**.

Some important reservoirs/dams of Southern India:

Dams/Reservoirs	River	State
Tungabhadra	Tungabhadra River	Karnataka's Vijayanagara district
Linganamakki reservoir	Sharavathi river	Karnataka's Shivamogga district
Supa reservoir	Kali river	Karnataka's Uttara Kannada district
Nagarjuna Sagar and Srisaillam	Krishna river	Andhra Pradesh-Telangana border
Gandikota Reservoir	Penna River	Kadapa district, Andhra Pradesh
Mettur dam	Cauvery river	Salem, Tamil Nadu
Idukki reservoir	Periyar River	Kerala
Idamalayar dam	Periyar River	Kerala
Kallada and Kakki reservoirs	Kallada river and Kakki river	Kerala

Here is why Ladakh needs the Sixth Schedule and statehood

Section: Indian physical geography

Context:

- Sonam Wangchuk, a celebrated environmentalist and innovator, decided to sit on a 21-day hunger strike to express the anguish of Ladakhis.
- The **Ladakhi leaders** approached the MHA with **four demands:** 1) Statehood for Ladakh 2) Inclusion of Ladakh under the Sixth Schedule of the Indian Constitution 3) Setting up of a separate public service commission for Ladakh 4) Two parliamentary seats for Ladakh.

Challenges in Ladakh:

- **Region's vulnerability to bureaucratic dominance and potential exploitation by industrial interests without adequate safeguards** for its **environment and people**.
- The **dilution of the Autonomous Hill Councils' authority**.
- **Environmental and ecological challenges** are characterized by low-density wildlife populations adapted to the extreme climate, scarce water resources, and a unique blend of Paelearctic and Indo-Malayan biodiversity.
- The **ecological balance** is further disturbed by **pollution, climate change** impacts on **flora and fauna**, and **unsustainable practices** that threaten **traditional livelihoods and the region's natural heritage**.

Need for sixth schedule status:

- Ladakh faces significant challenges, particularly after the **administrative changes** following the **abrogation of Article 370 and 35A in 2019**, which transitioned **Ladakh** into a **Union Territory without a legislative body**.
- The region's inhabitants, known for their **frugality and sustainable living practices**, are at a crossroads.

- **Civil society organizations and local bodies** have advocated for **Sixth Schedule status** to provide **constitutional safeguards**, aiming to protect Ladakh's delicate ecosystem and cultural integrity.
- There is an **urgent need for protective measures** under the **Sixth Schedule** to ensure sustainable development, safeguard the environment, and preserve Ladakh's cultural and natural heritage.
- Without such protection, the region risks irreversible damage, threatening its status as a unique and vibrant part of India's and the world's natural and cultural landscape.

Major lakes in Ladakh:

- **Pangong Tso**
- **Tso Moriri (Ramsar site)**
- **Tso Kar (Ramsar site)**
- **Yaye Tso**
- **Chagar Tso**

Major protected areas in Ladakh:

- **Hemis National Park:**
 - It is a **high-elevation national park** in **Ladakh, India**.
 - Globally famous for its **snow leopards**, it is believed to have the **highest density** of them in any protected area in the world.
 - It is the **only national park** in **India** that is **north of the Himalayas**, the **largest notified protected area in India** (largest National park) and the **second largest contiguous protected area**, after the **Nanda Devi Biosphere Reserve** and surrounding protected areas.
 - The park is **bounded** on the **north** by the **banks** of the Indus River and includes the catchments of **Markha, Sumdah** and **Rumbak**, and parts of the **Zaskar Range**.
- **Karakoram Wildlife Sanctuary:**
 - Also known as the **Karakoram (Nubra Shyok) Wildlife Sanctuary** or the **Karakoram (Saichen Shyok) Wildlife Sanctuary** is a **high-altitude wildlife sanctuary** located in the **easternmost reaches** of the **Karakoram range** in **Leh district**, in the **Indian Union territory of Ladakh**.
 - It was established in **1987** and covers an area of about **5,000 square kilometres** (500,000 ha).
 - It is an important wildlife sanctuary due to being one of the few places in India with a migratory population of the **Chiru** or **Tibetan Antelope**.
 - It is classified as an **IUCN-protected area (category IV)** by the **World Conservation Monitoring Centre**.
 - The **Botanical Survey of India** has called the **wildlife sanctuary** an "**under-explored area with regards to botanical knowledge**".
 - **Karakoram Wildlife Sanctuary** could become the "**transboundary counterpart**" of the **Central Karakoram National Park** in **Gilgit Baltistan**.
- **Changthang Wildlife Sanctuary (Ramsar Site):**
 - It is located in the **Changthang Plateau**. It has one of the **highest lakes on earth**, **Tso Moriri (4595 m)**.
 - **Korzok monastery** (Korzok village) is located on the **north-western bank** of **Tso Moriri**.
 - **Major Fauna:** Snow leopard, kiang or Tibetan Wild Ass (LC), argali or Great Tibetan Sheep (NT).
 - **Hanle Dark Sky Reserve:** It is located in **DigpaRatsa Ri**, aka **Mt Saraswati**, at **Hanle** in **Ladakh** as a part of **Changthang Wildlife Sanctuary**.

Why INS Jatayu, India's new naval base in Lakshadweep, matters

Section: Mapping

Context:

- On March 6th, the **Indian Navy** will **commission** the **Naval Detachment Minicoy** as **INS Jatayu**, transforming it into an **upgraded naval base** at the **strategic Lakshadweep Islands**

Details:

- This development represents a significant step in **enhancing India's security infrastructure in the region**.

- The **Minicoy detachment**, located on the **southernmost atoll of the Lakshadweep archipelago**, has been **operational since the 1980s**, but its upgrade to **INS Jatayu** marks it as the **country's second naval base in Lakshadweep**, following **INS Dweeprakshak in Kavaratti**, commissioned in **2012**.
- This event comes shortly after the joint inauguration of an airstrip and a jetty on the **Mauritian island of Agaléga**, showcasing **India's strategic interests in the Indian Ocean**. The prefix **INS** is used for **ships, bases, and detachments** of the **Indian Navy**.

INS Jatayu naval base:

- The **Naval Detachment Minicoy**, currently under the **command of the Naval Officer-in-Charge (Lakshadweep)**, is set to be commissioned as **INS Jatayu**, transforming it into a **full-fledged naval base**.
- This transition involves **enhancing the base's facilities beyond its existing administrative, logistics, and medical capabilities** to include additional infrastructure like an **airfield, housing, and personnel**, subject to **environmental** and other necessary clearances.
- The **construction efforts**, particularly for a **jetty**, may face challenges due to the **island's fragile ecology**, but plans are underway to develop an **airfield** capable of supporting both **military and civil aircraft operations**.
- The **establishment of INS Jatayu as an independent naval unit** with comprehensive infrastructure **aims to bolster the Indian Navy's operational capability in the Lakshadweep Islands**, aligning with the **government's strategy for the islands' holistic development**.
- The base is expected to extend the **Navy's operational reach, support anti-piracy and anti-narcotics efforts** in the **western Arabian Sea**, and enhance its role as a first responder in the region.
- The **commissioning of INS Jatayu** and the proposed **airfield** will significantly strengthen the **Navy's presence on the western seaboard**, enabling the **operation of various aircraft**, including **P8I maritime reconnaissance aircraft and fighter jets**.
- This development is particularly pertinent as **India** seeks to **counter Chinese influence** in the **Indian Ocean Region** amidst strained relations with the Maldives following the election of a pro-China president.

About Lakshadweep Islands:

- **Lakshadweep**, meaning a **hundred thousand islands'** in **Sanskrit** and **Malayalam**, is an **archipelago** comprising **36 islands**, stretching between **220 km and 440 km** off the **coast of Kochi, India**.
- With **only 11 of these islands being inhabited**, the **total land area of Lakshadweep** is merely **32 square kilometers**. The archipelago forms part of a significant **chain of coralline islands** in the **Indian Ocean**, which also includes the **Maldives** to the **south** and the **Chagos archipelago** further **south, across the equator**.
- Due to its **strategic location in the Indian Ocean**, **Lakshadweep** holds immense strategic value for India.
- **Minicoy Island**, in particular, is crucial as it **lies adjacent to vital Sea Lines of Communications (SLOCs)**, including the **Eight Degree Channel** (between Minicoy and the Maldives) and the **Nine Degree Channel** (between Minicoy and the main cluster of Lakshadweep islands), making these islands significantly important but also exposed to risks of marine pollution.
- It consists of three major islands. They are ,
- **Amindivi Islands** (consisting of six main islands of Amini, Keltan, Chetlat, Kadmat, Bitra and Perumul Par). [don't have to remember all these names]
- **Laccadive Islands** (consisting of five major islands of Androth, Kalpeni, Kavaratti, Pitti and Suheli Par) and
- **Minicoy Island**.
- At present these islands are collectively known as Lakshadweep.
- The Lakshadweep Islands are a group of 25 small islands.
- They are widely scattered about 200-500 km south-west of the Kerala coast.
- Amindivi Islands are the northern most while the **Minicoy Island** is the southernmost.
- All are tiny islands of **coral origin** {Atoll} and are
- They are **surrounded by fringing reefs**.
- The largest and the most advanced is Lakshadweep Islands the **Minicoy Island** with an area of 4.53 sq km.
- Most of the islands have low elevation and do not rise more than five meter above sea level (Extremely Vulnerable to sea level change).
- Their topography is flat and relief features such as hills, streams, valleys, etc. are absent.



About India's First Under-River Metro Tunnel

Section: Mapping

- It is a part of **Kolkata Metro's East-West Corridor**.
- It passes under the **Hooghly River** and forms part of section from **Howrah Maidan to Esplanade**.
- The stretch also has the deepest metro station in the country, the Howrah Maidan station, at 32 metres below ground level.

River Hooghly:

- The Hooghly River, also known as the **Bhagirathi-Hooghly** and **Kati-Ganga Rivers**.
- It is a distributary or arm of the Ganges River.
- It is formed in **Murshidabad**, where the Ganga splits into two parts, while the part flowing through Bangladesh is called the Padma.
- The Hooghly River is silted up above Kolkata, and the river flows to the west and south to the estuary of Rupnarayan and then south and southwest to enter the Bay of Bengal through a 32-kilometer-wide estuary.
- **Haldi, Ajay, Damodar and Rupnarayan** are the rivers that feed the lower reaches of the Hooghly.
- The important cities near the Hooghly River are **Jiaganj, Azimganj, Murshidabad, and Baharampur**

Backed by BrahMos, the Navy's Minicoy base to keep watch over the Arabian Sea

Section: Mapping

INS Jatayu:

- The **Indian Navy** is significantly enhancing its capabilities with the establishment of **INS Jatayu** on **Minicoy Island in Lakshadweep**. This new base will feature **advanced radar systems, jetties, an airfield, and coastal batteries** equipped with **BrahMos supersonic cruise missiles**.
- Additionally, new infrastructure and facilities were inaugurated at the **Karwar naval base in Karnataka**, including **major piers and residential accommodations**, enhancing the living conditions for officers and civilian defence personnel.
- The **inclusion of extended-range BrahMos missiles and new radar facilities** at **Minicoy** is intended to **improve India's surveillance capabilities and provide a flexible response to threats**.

Importance of 'INS Jatayu' naval base:

- This upgrade aligns with **India's long-term plan to bolster its security presence in strategic locations**, particularly to counter the **expanding Chinese naval activities** in the **Indian Ocean**.
- The importance of this base is underscored by its proximity to the **critical Sea Lanes of Communication (SLOC)** and its position a few hundred miles from the **Maldives**.
- It also aims to strengthen India's position in the emerging global maritime order, contributing to the Maritime Domain Awareness network and enhancing the capabilities of the **Quad Alliance**.

- The development also aimed at **boosting tourism** and **accommodating increased demand from tourists**, such as the expansion of the **Agatti airfield** and the development of a **dual-use airfield in Minicoy** with a longer runway.

Karwar naval base (INS Kadamba):

- Code named **Project Seabird**.
- It has undergone significant expansion since its **Phase I completion in 2011**, which initially allowed accommodation for **10 ships**.
- This expansion includes the **Cabinet Committee on Security-approved Phase IIA**, significantly enlarging the **base's capacity to berth 32 ships and submarines, plus 23 yardcraft**. Phase IIA features include extensive **berthing space, technical facilities, electrical substations**, and an iconic **Covered Dry Berth** for **simultaneous maintenance of up to four capital ships**.
- This phase also introduces **four townships providing around 10,000 dwelling units** for various personnel and a **dual-use naval air station** with a **2,700-metre runway alongside a civil enclave for commercial flights**.
- **Unique features:**
 - The Navy's aircraft carrier **INS Vikramaditya** is based at **Karwar**.
 - The base also has the **country's first sealift facility**, a unique **“shiplift”** and **transfer system** for **docking and undocking ships and submarines**.
- **Significance:**
 - Once fully operational, the expanded base is expected to **house approximately 50,000 individuals**, significantly benefiting the local economy.
 - The expansion underscores the **strategic importance of maintaining robust naval capabilities**, especially considering the ongoing maritime security challenges, such as **drone and missile attacks in the Red Sea** and **piracy in the Gulf of Aden**, emphasizing the **critical role of sea lanes in global trade**, with over **90% of India's trade transiting by sea**.

Minicoy island:

- **Minicoy**, locally known as **Maliku**, is an island in Lakshadweep, India.
- Along with **Viringili**, it is on **Maliku atoll**, the **southernmost atoll of the Lakshadweep archipelago**.
- Administratively, it is a census town in the Indian union territory of Lakshadweep.
- The **island** is situated **425 km west of Trivandrum**, the **capital city of Kerala**.
- The **Eight Degree Channel** separates the **islands of Minicoy and Maldives**.
- The **Nine Degree Channel** separates the **island of Minicoy** from the **main Lakshadweep archipelago**.

Sela Tunnel

Section: Map

Context: Prime Minister Shri Narendra Modi virtually dedicated to the nation the Sela Tunnel project during the *Viksit Bharat Viksit North East* programme in Itanagar, Arunachal Pradesh on March 09, 2024

Details:

- The tunnel has been constructed by the Border Roads Organisation (BRO) at an altitude of 13,000 feet on the road connecting Tezpur, Assam to Tawang in the West Kameng district of Arunachal Pradesh. Built at a total cost of Rs 825 crore, the tunnel will provide all-weather connectivity to Tawang across Sela Pass on the Balipara - Chariduar - Tawang Road, boosting the preparedness of the Armed Forces and augmenting the socio-economic development of the border region.
- The Sela Tunnel, a **strategically vital infrastructure project in Arunachal Pradesh**, is nearing completion.
- Sela Tunnel will provide all-weather connectivity and improve the ease of travel for the people of Tawang
- The Sela Tunnel has been **excavated below the Sela Pass, a high-altitude mountain pass situated at an elevation of 4,200 meters (13,800 feet) above sea level**.
- The region experiences **heavy snowfall and landslides**, leading to frequent closures of the pass, effectively cutting off Tawang from the rest of Arunachal Pradesh.

BRO connects strategic Nimmu-Padam-Darcha road in Ladakh

Section: Mapping

Context:

- **Border Roads Organisation (BRO) connected the strategic Nimmu-Padam-Darcha road in Ladakh on March 25, 2024.** This 298-km road will connect Manali to Leh through Darcha and Nimmu on Kargil – Leh Highway.

More on news:

- The road is now the **third axis apart from Manali-Leh and Srinagar-Leh which connects Ladakh to the hinterland.**
- The Nimmu-Padam-Darcha road derives its strategic importance from the fact that it is not only shorter vis-a-vis the other two axes, **but crosses only one pass ie Shinkun La (16,558 feet) on which tunnel work is about to commence by the BRO.**
- This will result in the road having all weather connectivity to the Ladakh region.
- The connectivity will strengthen the defense preparedness and provide a boost to the economic development in the **Zaskar valley.**
- With construction of **Shinkun La tunnel** commencing, the third all weather axis to Ladakh will be established.

About BRO:

- The Border Roads Organisation (BRO) is a **statutory body under the ownership of the Ministry of Defence of the Government of India.**
- BRO develops and maintains road networks in India's border areas and friendly neighboring countries.
- It is staffed by officers and troops drawn from the Indian Army's Corps of Engineers, Electrical and Mechanical Engineers, Army Service Corps, Military Police and army personnel on extra regimental employment.
- Engineering Service and personnel from the General Reserve Engineer Force (GREF) form the parent cadre of the Border Roads Organisation.
- Currently, the organization maintains operations in **twenty-one states, one UT (Andaman and Nicobar Islands), and neighboring countries** such as **Afghanistan, Bhutan, Myanmar, and Sri Lanka.**
- The BRO operates in 18 projects namely: **Arunank, Beacon, Brahmanak, Chetak, Deepak, Dantak (Bhutan), Himank, Hirak, Pushpak, Sampark, Yojak, Sewak, Shivalik, Swastik, Udayak, Vartak and Vijayak.** **Beacon is the oldest BRO project (along with Vartak).**

Areas in news:

- **About Nimmu:**
 - Nimo or Nyemo is a village and the headquarters of an eponymous community development block in the Leh district of Ladakh, India.
 - It is located in the **Leh tehsil, 35 km from Leh.**
- **About Padum:**
 - Padum is the main town and the administrative center of the Zaskar tehsil in Kargil district, Ladakh, India.
 - Named after the **Buddhist guru Padmasambhava**, it was historically one of the two main capitals of the Zaskar Kingdom, the other being Zangla.
 - It is 235 km via the link road from Kargil city.
- **About Darcha:**
 - Darcha (elevation 3,360 m or 11,020 ft)[1] is a pair of villages (Darcha Sumdo and Darach Dangma) on the Bhaga River in the Lahaul sub-division in the Lahaul and Spiti district in the Indian state of Himachal Pradesh.
 - It is the northernmost permanent settlement in Himachal Pradesh along the Manali-Leh Highway.

ICCC: Integrated farm data dashboard for customized solutions

Section: Mapping

Context:

- Earlier this month, Agriculture Minister Arjun Munda inaugurated a **Krishi Integrated Command and Control Centre (ICCC) set up at Krishi Bhavan in New Delhi**, a big-screen dashboard of all digital innovations in the sector.

More on news:

- Officials described the ICCC as a “significant leap forward” in leveraging technology for the advancement of agricultural practices.

What is the Krishi ICCC?

- The ICCC is a tech-based solution involving multiple IT applications and platforms, which is designed to help in making informed decisions.

- The center is housed in the **Ministry of Agriculture & Farmers' Welfare, which is responsible for legislation, policy formation, and implementation of initiatives in the agriculture sector.**
- The ICCC uses state of the art technologies such as **artificial intelligence, remote sensing, and Geographic Information Systems (GIS)** to collect and process large amounts of granular data — on temperatures, rainfall, wind speed, crop yields and production estimations — and presents it in graphical format.

What do you get as the visual output?

- On eight large, 55-inch LED screens installed at the ICCC, you can see information on crop yields, production, drought situation, cropping patterns (geographic region-wise and year-wise) in map, timeline, and drill-down views.
- You can also see the relevant trends (periodic and non-periodic), outliers, and **Key Performance Indicators (KPIs), and receive insights, alerts, and feedback on agriculture schemes, programmes, projects, and initiatives.**
- The ICCC uses platforms including the **Krishi Decision Support System (DSS)** to collect micro-level data, process it, and present the macro picture.
- The ICCC has a contact center and a **helpdesk facility, with the operator's handset capable of being converted into a call center.**
- If needed, farmer beneficiaries can interact directly with officials or the Minister through video conferencing facilities.

What is the objective of the ICCC?

- The ICCC will enable comprehensive monitoring of the farm sector by making available at one place geospatial information received from multiple sources, including **remote sensing; plot-level data received through soil survey; weather data from the India Meteorological Department (IMD); sowing data from Digital Crop Survey; farmer- and farm-related data from Krishi Mapper, an application for geo-fencing and geo-tagging of land; market intelligence information from the Unified Portal for Agricultural Statistics (UPAg); and yield estimation data from the General Crop Estimation Survey (GCES).**
- The integrated visualization of the data will enable quick and efficient decision-making by the ICCC ecosystem can be linked with the PM-Kisan chatbot going forward.

Can the command-and-control center generate individual farmer-specific advisories?

- **The ICCC can create an ecosystem based on which individual farmer-level advisories can be generated through apps like Kisan e-mitra, a chatbot developed for PM-Kisan beneficiaries.**
- The AI-/ machine learning-based system will identify a farmer through his/ her mobile number or Aadhaar, and match it with the farmer's field information obtained through land records, historical crop sowing information from the crop registry, weather data from IMD, etc.
- It will then generate a customized advisory in the local language of the farmer.
- For this, the system will use the Bhashini platform that allows translation into several Indian languages.

Practical Applications of ICCC:

Farmers Advisory:

- The ICCC allows visualization of GIS based soil carbon mapping as well as soil health card data for a particular district together at one place.

Drought Actions::

- According to officials, **increase or decrease in yield from a specific region (as per GCES data) can be correlated with weather, rainfall, and other information visualized through the Drought Portal,** enabling the administration to understand the reason for increase/ decrease in yield and to take decisions proactively.

Crop Diversification:

- An analysis of crop diversification maps, together with field variability for paddy, will enable decision-makers to identify regions with scope for diversified cropping, so that farmers can be advised accordingly.

Farm Data Repository:

- **Krishi Decision Support System (K-DSS), a platform under development,** will act as an agriculture data repository. Integrated spatial and non-spatial data will be superimposed as a layer on the GIS map, and various AI/ ML models would be run on the data.
- **The K-DSS will help in evidence-based, efficient, and data-driven decision-making,** and assist in preparing customized advisories for farmers.

Validation of Yield:

- Yield as captured through **Krishi MAppler** can be analyzed with the yield generated through GCES application for a plot.

NASA touts research in 'space labs' to fight cancer

Section: Mapping

Context:

- NASA officials announced significant advancements in **cancer research** conducted in the **weightless environment of space**, aligning with U.S. President Joe Biden's **passionate initiative to combat cancer**.
- **Astronaut Frank Rubio** undertook this research on the **International Space Station (ISS)**, leveraging the **unique conditions of space to accelerate and refine the study of cellular behaviours related to cancer**.

Why 'Space' is a more suitable environment for cancer research?

- In **space**, cells **age more rapidly** and **do not clump together due to the absence of gravity**, allowing for a **purier structural analysis**.
- This environment has proven **advantageous** for **pharmaceutical research**, exemplified by **Merck's experiments with Keytruda**, an **anti-cancer drug**.
- The focus was on **crystallization processes** that could lead to **more effective drug delivery methods**.
- **Space-based experiments** demonstrated that **smaller, more uniform crystals formed more efficiently in space**, potentially **enabling the drug to be administered via injection** rather than through **extensive chemotherapy sessions**.
- This research paves the way for **developing drugs that can be stored at room temperature** and **simplifies treatment protocols**.

'Cancer Moonshot' initiative:

- The **history of cancer research in space** spans over **40 years** but has seen revolutionary progress recently.
- The efforts contribute to **President Biden's "Cancer Moonshot" initiative**, which **aims to significantly reduce cancer death rates over the next 25 years**.
 - **Aim:** Bringing down cancer death rates by 50 per cent by the year 2047
- This initiative not only underscores the potential of space research in medical science but also demonstrates a commitment to leveraging every possible avenue in the fight against cancer.

Fourth mass coral bleaching

Section: Oceanography

Context : According to the U.S. NOAA, the world is on the verge of a **fourth mass coral bleaching event** which could see wide swathes of tropical reefs die, including parts of **Australia's Great Barrier Reef**.

Coral reef

- But corals are quite sensitive to warming water. They host a microscopic symbiotic alga called **zooxanthella that photosynthesizes** just like plants, providing food to the coral. When the surrounding waters get too warm for too long, the zooxanthellae leave the coral, and the coral can turn pale or white – a process known as bleaching.
- If corals stay bleached, they can become energetically compromised and ultimately die.
- When corals die or their growth slows, these beautiful, complex reef habitats start disappearing and can eventually erode to sand.

Importance of coral reefs:

- Coral reefs are **hot spots of biodiversity**. They are often referred to as the rainforests of the sea because they are home to the highest concentrations of species in the ocean.
- Healthy reefs are vibrant ecosystems that **support fish and fisheries**, which in turn support economies and food for millions of people.
- Additionally, they provide billions of dollars in economic activity every year through tourism, particularly in places like the Florida Keys, where people go to scuba dive, snorkel, fish and experience the natural beauty of coral reefs.
- If that isn't enough, reefs also protect shorelines, beaches and billions of dollars in coastal infrastructure by buffering wave energy, particularly during storms and hurricanes.

What is Coral Bleaching?

- When corals face stress by changes in conditions such as temperature, light, or nutrients, they **expel the symbiotic algae zooxanthellae** living in their tissues, causing them to turn completely white. This phenomenon is called **coral bleaching**.

- The **pale white colour** is of the translucent tissues of calcium carbonate which are visible due to the loss of pigment producing zooxanthellae.
- Bleached corals can survive depending on the levels of bleaching and the recovery of sea temperatures to normal levels.
- If heat-pollutions subside in time, over a few weeks, the zooxanthellae can come back to the corals and restart the partnership but severe bleaching and prolonged stress in the external environment can lead to coral death.
- Over the last couple of decades, climate change and increased global warming owing to rising carbon emissions and other greenhouse gases have made seas warmer than usual.
- Coral bleaching has occurred in the Caribbean, Indian, and Pacific oceans on a regular basis.

Mass Coral Bleaching:

To officially declare a global mass bleaching event, widespread bleaching must be observed in three major ocean basins: the **Atlantic, Pacific, and Indian Oceans**. According to Manzello, "technically we're already there" in 2024, pending final confirmation from Indian Ocean scientists.

Previous Mass Coral Bleaching

- **First Mass Bleaching:** It occurred in 1998 when the El Niño weather pattern caused sea surfaces in the Pacific Ocean to heat up; this event caused 8% of the world's coral to die.
- **Second Mass Bleaching:** This event took place in 2002. In the past decade, however, mass bleaching occurrences have become more closely spaced in time, with the longest and most damaging bleaching event taking place from 2014 to 2017.
- **Third Mass Bleaching:** The event that took place between 2014-17 affected reefs in Guam in the Western Pacific region, the North, South-Pacific, and the Indian Ocean.

What are the Findings of the National Oceanic and Atmospheric Administration (NOAA)?

- The world is on the verge of a fourth mass coral bleaching event (after 1998, 2010 and 2014).
- Preliminary results suggest that about 15% of the world's reefs saw large coral die-offs in this event.
- This year is turning out to be even worse. For example, following the Northern Hemisphere summer last year, the Caribbean registered its worst coral bleaching on record.
- Coral bleaching is often tied to the naturally occurring **El Niño climate phenomenon which leads to warmer ocean waters**.
- The world also just registered (as a result of climate change) its first 12-month period with an average temperature over 1.5 degrees Celsius (2.7 degrees Fahrenheit) above pre industrial levels.
- A rise of 1.5C is believed to be the tipping point for mass coral die-offs, with scientists estimating that 90% of the world's corals could be lost.

Initiatives to Protect Corals

- **International Coral Reef Initiative**
- **Global Coral Reef Monitoring Network (GCRMN)**
- **Global Coral Reef Alliance (GCRA)**
- **The Global Coral Reef R&D Accelerator Platform**
- Similarly, the Ministry of Environment and Forests and Climate Change (MoEF&CC), India has included the **studies on coral reefs under the Coastal Zone Studies (CZS)**.
- In India, the Zoological Survey of India (ZSI), with help from Gujarat's Forest department, is **attempting a process to restore coral reefs using "biorock" or mineral accretion technology**.
- **National Coastal Mission Programme**, to protect and sustain coral reefs in the country.

Bengaluru water crisis: Is the southern metropolis heading towards Day Zero?

Section: Oceanography

Context:

- **Bengaluru, India's third-most populous city**, faces its **most severe potable water crisis** in its **nearly 500-year history**. Over **30 localities** are receiving water on a rotational basis every other day, risking reaching a '**Day Zero**' scenario akin to **Cape Town in 2018**.
- **Day Zero:** The day when the municipal water supply for this major city was estimated to run out.

Causes of water crisis:

- The crisis is attributed to the **destruction of water bodies and wetlands** due to **real estate expansion since 1990**, mirroring **Cape Town's experience**.
- **Bengaluru** now relies on **distant river water**, compromised by recurring droughts.
- A **2016 International Lake Conference** predicted this scenario, citing government policies over the past **30 years** that **favored urban development over environmental preservation**.
- **Impact of Urbanisation:**
 - A study by the **Indian Institute of Science** highlights the **negative effects of unplanned urbanisation** on **Bangalore's ecology, hydrology, and environment**. It points to **increased pollution, water scarcity, and mismanagement of waste** due to **rapid urban expansion**.
- **Deterioration of Lakes:**
 - **Bengaluru's 262 lakes in 1961** have **dwindled to 81**, mainly due to **real estate developments**.
 - Only **33** of these **lakes** remain **functional**, protected by their location in **non-reclaimable zones**. **Pollution** has significantly **reduced the quality and sustainability of these water sources**.

Government and Community Response:

- The **Karnataka government** has advised focusing on areas with **contaminated wells and directed Urban Local Bodies (ULBs)** to **protect water bodies** by removing encroachments and penalising waste dumping. Meanwhile, **Resident Welfare Associations (RWAs)** have implemented **water rationing, banned non-essential water usage**, and are **exploring alternative conservation methods**, such as using disposable cutlery and wet wipes to reduce water consumption.

Lake in news:

- Several species of birds are being sighted at **Doddakallasandra Lake in South Bengaluru**.

Details:

- The lake became a **temporary habitat** for several bird species including **Painted storks, black-headed ibis, little egrets, sandpipers, black-winged stilts, cormorants, grey-headed swamphens, peacocks, and glossy ibises**.
- Many of these birds, characterized by their long legs and bills, depend on wetlands for foraging.
- **Painted storks**, listed as "**Near Threatened**" on the **IUCN Red List**, were among the notable visitors with their distinctive pink flight feathers. **Purple swamphens** were also seen engaging in playful chases.

History

Cuttack Rupa Tarakasi, Banglar muslin get GI tag

Section: Art and Culture

Context:

- The famous **Cuttack Rupa Tarakasi (Silver Filigree)** has been given the Geographical Indication (GI) tag by the Geographical Indications Registry in Chennai.

More on news:

- **Narasapur crochet lace products and Kutch rogan craft** are among those given the Geographical Indication tag
- The application for this was filed by the Odisha State Cooperative Handicrafts Corporation Limited and was facilitated by the Department of Textile and Handicrafts, Government of Odisha.
- Filigree has been traditionally associated with fine craftsmanship and luxurious design in classical jewelry.

Various products to get GI tag:

Crochet lace work

- The **Banglar muslin** is one of the popular traditional handloom craft of Bengal.
- **Narsapur in West Godavari region of Andhra Pradesh** is known for crochet skills, and has received global acclaim for its intricate craftsmanship.

Ratlam Riyawan Lahsun (Garlic):

- It is a variety named after **Riyawan village in Ratlam district of Madhya Pradesh** also bagged the GI tag.

Ambaji White Marble:

- Ambaji Superior White Marble is an Indian marble stone of pure white Color with light grey veins. This rock is quarried in **marble mines of Gujrat (India)**.
- It is formed when limestone is re-crystallised under the earth's crust due to intense pressure and heat.

Tripura Risa Textile:

- The traditional Tripuri female attire comprises three parts — **risa, rignai and rikutu**.
- Risa is a handwoven cloth used as a female upper garment, and also as headgear, a stole, or a present to express respect.
- As an upper garment, it is wrapped around the torso twice.

Hyderabad Lac Bangles:

- The lac bangles of Hyderabad have been registered with the **Registrar of Geographical Indications, Chennai**.
- This is the **second GI tag for a Hyderabad product after haleem**.

Majuli Mask of Assam:

- Majuli mask of Assam are made in different variety and sizes as they are mainly divided into different categories — **'Mukha bhaona'** face mask covers the face, **'Lotokoi'** hanging mask which is bigger in size extends to the chest and, **'Cho Mukha'** huge mask is a head and body mask.

Assam Majuli Manuscript Paintings:

- **Assam Majuli Manuscript Paintings** illustrated numerous stories and chapters taken from the great **Hindu epics Ramayana, Mahabharata** and above all subjects from the Bhagavata Purana.

About GI tags:

- It is an insignia on products having a unique geographical origin and evolution over centuries with regard to its special quality or reputed attributes.
- It is a mark of authenticity and ensures that registered authorized users or at least those residing inside the geographic territory are allowed to use the popular product names.
- **GI tag in India is governed by Geographical Indications of Goods (Registration & Protection) Act, 1999. It is issued by the Geographical Indications Registry (Chennai).**
- GI is a tag on products that have a specific geographical origin and possess certain qualities due to that origin and are safeguarded by **legalities such as by the World Intellectual Property Organisation**.
- The registration of a geographical indication is valid for a period of **10 years**
- It can be renewed from time to time for a further period of **10 years each**.

GI recognition for Narasapur crochet lace craft revives hopes of struggling artisan

Section: Art and Culture

Context:

- The **Narasapur crochet lace craft** from the **Godavari region of Andhra Pradesh** has been awarded the **Geographical Indications (GI) tag**, revitalizing this **traditional craft**.

Details:

- Conferred by the **Department of Promotion of Industry and Internal Trade (DPIIT)** under the **Ministry of Commerce and Industry**.
- The craft is centralized around **key trading hubs** such as **Narsapur and Palacole in West Godavari district** and **Razole and Amalapuram in the Konaseema region**.
- It supports nearly 15,000 women artisans who specialize in producing **lace-based garments, home furnishings, and accessories**.
- **Alankriti Lace Park in Narasapur town** is run by the **state government**.

Tracing the origin:

- The **Narasapur crochet lace craft**, which dates back to **1844**, was introduced to **local women in the Godavari region** by **Macrae and his wife**, associated with a **Christian missionary** in **Dummugudem** (now in Telangana), **Scotland**.
- They facilitated the sale of these products both in **India** and **overseas**. Despite challenges like the **Indian famine of 1899** and the **Great Depression of 1929**, the craft thrived, involving over 2,000 women by the early 1900s.

History of Narasapur:

- The existence of Narsapur dates back to **1173 AD**. **Dutch people** landed in **Narsapur** in **1626**. **Narsapur** was used as a **port by the Dutch** and ships and boats were built here.
- It was noted for its **ship-building activity** and some of the **Europeans** also were customers at this place; small boats are still built in Narsapur.
- In the **16th century**, **Portuguese** established their own factory which remained as a trading centre for a few years.
- In the **18th century**, **Narsapur** became an **important trading port**. From this port, **teak** was **exported to other regions**. The **ports at Kakinada** and **Narsapuram** became famous for **manufacturing ships**.
- **At present there is no port handling at Narsapur**.
- According to **Alexander Hamilton's A New Account of the East Indies (1727)**:
 - "Next to **Matchulipatam (Machilipatnam)** is **Narsipore**, where the **English** had a **Factory for long Cloth**, for the Use of their **Factory of Matchulipatam**, when they manufactured **Chintz** there. It also affords good **Teak Timber** for **building**, and has a fine deep River, but a dangerous Bar, which makes it little frequented."
- The **trade of the town** has **steadily declined** since the **abolition of the company's factory in 1827**.

Madhya Pradesh HC orders ASI survey of Bhojshala complex

Section: Art and culture

Context:

- The Indore Bench of the Madhya Pradesh High Court on Monday directed the Archaeological Survey of India (ASI) to conduct a scientific survey of the **Bhojshala Temple-Kamal Maula Mosque complex situated in the State's Dhar district**.

More on news:

- The site is an **ASI-protected, 11th Century CE monument**.
- Under an agreement with the ASI, puja is performed in the temple by Hindus every Tuesday and Namaz offered every Friday.

About Bhojshala:

- The **Bhojshala is an historic temple located in Dhar, Madhya Pradesh, India**.
- The name is derived from the celebrated king Bhoja of the **Paramāra dynasty of central India**, a patron of education and the arts, to whom major Sanskrit works on poetics, yoga and architecture are attributed.
- The architectural parts of the structure itself are of different periods but mainly date the **12th century**, with the Islamic tombs in the campus added between the 14th and 15th century.
- Bhojshala is presently a Monument of National Importance protected by the Archaeological Survey of India under the **Archaeological Sites and Remains Act, 1958**, otherwise known as the AMASR Act.

About King Bhoja:

- **Bhoja (1010–1055 CE) was an Indian king from the Paramara dynasty**.
- His kingdom was centered around the Malwa region in central India, where his capital Dhara-nagara (modern Dhar) was located.
- Bhoja fought wars with nearly all his neighbors in attempts to extend his kingdom, with varying degrees of success.

GI tag for Majuli masks of Assam: History, cultural significance of the centuries-old art form

Section: Art and culture

Context:

- The traditional Majuli masks in Assam were given a **Geographical Indication (GI) tag by the Centre on Monday (March 4)**.

More on news:

- Majuli manuscript painting also got the GI label.
- Majuli, the largest river island in the world and the seat of Assam's neo-Vaishnavite tradition, has been home to the art of mask-making since the 16th century.

What are Majuli masks?

- The handmade masks are traditionally used to **depict characters in bhaonas, or theatrical performances with devotional messages under the neo-Vaishnavite tradition.**
- These were introduced by the 15th-16th century reformer **saint Srimanta Sankardeva.**
- The masks can depict gods, goddesses, demons, animals and birds — **Ravana, Garuda, Narasimha, Hanuman, Varaha Surpanakha all feature among the masks.**
- They can range in size from those covering just the face (mukh mukha), which take around five days to make, to those covering the whole head and body of the performer (cho mukha), which can take up to one-and-a-half months to make.
- The masks are made of **bamboo, clay, dung, cloth, cotton, wood** and other materials available in the riverine surroundings of their makers.

Why is the art practiced in monasteries?

- Sattras are monastic institutions established by Srimanta Sankardev and his disciples as centers of religious, social and cultural reform.
- Today, they are also centers of traditional performing arts such as **borgeet (songs), sattriya (dance) and bhaona (theater), which are an integral part of the Sankardev tradition.**
- Majuli has 22 sattras, and the patent application states that the mask-making tradition is by and large concentrated in four of them — Samaguri Sattra, Natun Samaguri Sattra, Bihimpur Sattra and Alengi Narasimha Sattra.

The makers of the masks

- The arts of dance, song and musical instruments are closely tied to the sattras and the one who began this was Assam's guru Srimanta Sankardev.
- In the 16th century, he established this art of masks through a play called Chinha Jatra.
- At that time, to attract ordinary people to Krishna bhakti, he had presented the play in his birthplace Batadrava.
- Samaguri Sattra had been practicing mask-making since its establishment in 1663.

What is Majuli manuscript painting, which also received the GI tag?

- It is a form of painting also originating in the 16th century and is done on sanchi pat, or manuscripts made of the bark of the sanchi or agar tree, using homemade ink.
- The earliest example of an illustrated manuscript is said to be a rendering of the Adya Dasama of the Bhagwat Purana in Assamese by Srimanta Sankardev.
- This art was patronized by the Ahom kings.
- It continues to be practiced in every satra in Majuli.

What is Cuttack's famed silver filigree work, which recently received GI tag

Section: Art and culture

Context:

- The famous **Rupa Tarakasi, or silver filigree work of Odisha's Cuttack, has received the geographical indication (GI) tag.**

More on news:

- The **Odisha State Cooperative Handicrafts Corporation Limited (Utkalika)** had applied for the tag.
- A GI tag is conferred upon products originating from a specific geographical region, signifying unique characteristics and qualities.

Rupa Tarakasi

- **Odisha's Cuttack** is known for its silver filigree work, of intricate design and fine craftsmanship. In Odia, "tara" means wire and "kasi" means to design.
- As part of **Rupa Tarakasi, silver bricks are transformed into thin fine wires** or foils and used to create jewelry or showpieces.

- **In Cuttack the work is generally done by boys**, whose sensitive fingers, and keener sight enable them to put the fine silver threads together with the necessary rapidity and accuracy.
- The filigree work is quite distinct in character from the indigenous silver jewelry of the country.

Origin

- **While** the exact origin of the filigree art in Cuttack is not clear, it is known to have existed as far back as the 12th century.
- The art form received considerable **patronage under the Mughals**.
- Over the years, as Cuttack transitioned through the hands of different rulers, the silver filigree took on a new form with each.

History

- The silver filigree work in which the people of Cuttack have attained such surprising skill and delicacy is identical in character with that of Arabia, Malta, Genoa, Norway, Sweden and Denmark, and with the filigree work of ancient Greece, Byzantium, and Etruria, and was probably carried into the West by the Phoenicians and Arabs, and into Scandinavia by the Normans and in the course also of the medieval trade between Turkestan and Russia.
- Popular Product Categories:
- The iconic items found only in Cuttack are the Durga Puja Medha (silver decorations for the Durga idol and pandal), Odissi jewelry, religious/cultural pieces linked directly to the customs of Odisha, and the Dama chain.

Ministry of Minority Affairs approves 'Centre of Jain Manuscriptology' (GUCJM) at Gujarat University

Section: Art and culture

Context:

- In the spirit of 'Virasat Se Vikas' and 'Virasat Se Samvardhan', The Ministry of Minority Affairs inspired by 'Panch Pran' of Honorable Prime Minister, has approved the 'Centre of Jain Manuscriptology (GUCJM) at Gujarat University amounting to Rs. 40 Crore.

More on news:

- Centre aims at academic support for development of **Apabhramsh and Prakrit language of Jainism in the University under PMJVK scheme**
- Centre facilitates collaboration between the University and the Ministry to enhance educational opportunities for minority communities in India to carry out research in the field of Jain Studies.
- The initiative will promote education and research in the field of Jain Studies and empowerment of minority communities through education and research.

About Pradhan Mantri Jan Vikas Karyakram (PMJVK) scheme:

- **Pradhan Mantri Jan Vikas Karyakram (PMJVK), a Centrally Sponsored Scheme (CSS).**
- The scheme functions under the **Ministry of Minority Affairs**.
- It is an area development programme under which **community infrastructure and basic amenities are being created in the identified areas**.
- The scheme is being implemented under the aegis of the **State Governments/ Union Territory (UT) Administrations** on a fund sharing pattern and the projects are implemented and managed by the concerned State/ UT Government.
- The scheme was restructured and implemented with effect from May, **2018 as Pradhan Mantri Jan Vikas Karyakram (PMJVK), so as to reduce gaps**, if any, in the socio-economic parameters in 1300 identified areas of the country.

About Jain Minorities:

- This made the **Jain community, which makes for 9.5 million or 0.72 percent of the population as per 2011 census**.
- It is the sixth community to be designated this status as a "national minority", **after Muslims, Christians, Sikhs, Buddhists, and Parsis**.

About Apabhramsha language

- It is a **literary language of the final phase of the Middle Indo-Aryan languages**.
- When the **Prakrit languages were formalized by literary use, their variations came to be known as Apabhramsha**.
- Despite this close relationship, scholars generally treat Apabhramsha and the nonliterary Prakrits separately.

About Prakrit language:

- Prakrit is a group of **vernacular Middle Indo-Aryan languages** that were used in the Indian subcontinent from around the **3rd century BCE to the 8th century CE**.
- The term Prakrit is usually applied to the middle period of **Middle Indo-Aryan languages, excluding earlier inscriptions and Pali**.

Son's tribute to father, 'piece of Gujarat in Delhi': Story of ChausathKhamba

Section: Arts and Culture

About ChausathKhamba:

- ChausathKhamba, also spelled **ChaunsathKhamba**, is a **tomb built during 1623–24**.
- It is located in **Nizamuddin precincts of Sufi Muslim shrines** and tombs in New Delhi, India.
- The name means "**64 pillars**" in Urdu and Hindi.
- The structure houses the tomb of **Mirza Aziz Koka, foster brother of Mughal Emperor Akbar**.
- It was built by **Mirza Aziz Koka, son of Ataga Khan**, as a mausoleum for himself, at the time when **Mughal Emperor Jahangir ruled from Delhi**.
- **Mirza Aziz Koka** had served several times as Jahangir's Governor of Gujarat before he died in Gujarat.
- The tomb enclosure is entered through a lofty arched gateway and has a large sunken forecourt.
- The mausoleum is unique on account of it being built entirely of marble, **with 25 marble domes supporting the flat roof of the structure**.
- The plan for **ChausathKhamba** could have been inspired from the wooden garden pavilions from Persia — such as the **ChihilSutun**, and in turn, the ChausathKhamba seems to have inspired the architectural design for **Emperor Shahjahan's Diwan-i-Aam, Hall of Audience**.
- Each facade of the square structure has five marble arches inset with marble jalis or lattice screens, and a doorway in the central arch providing access to the tomb.
- The column capitals are intricately carved with simple yet striking pendentives bridging the square floor plan to the circular dome above.
- The Aga Khan Trust for Culture along with the **Archaeological Survey of India (ASI) undertook the conservation of ChausathKhamba**.
- **The project was co-funded by the Federal Republic of Germany.**

About Urs Mahal:

- Urs is the death anniversary of a **Sufi saint in South Asia, usually held at the saint's dargah (shrine or tomb)**.
- Urs Mahal is located in front of the ChausathKhamba and it's an assembly hall where Qawwali programmes are held on festival days and on the days during **Urs of Sufi saint Nizamuddin Auliya**.
- It is a **protected monument (refurbished in 2003)**.
- In most Sufi orders such as **Chishtiya, etc. the concept of Urs exists and is celebrated with enthusiasm**.

T M Krishna conferred Sangita Kalanidhi

Section: Arts and Culture

Context:

- Renowned **carnatic singer T M Krishna** has been conferred the Sangita Kalanidhi for 2024 by the Music Academy.

More on news:

- T M Krishna highlighted the non-inclusive nature of the artform and the **music season, wherein non-Brahmin musicians** and certain art forms such as **Pariyattam, Villupattu, Gaana-Pattu and Kuthu** were being left out.
- He started a music festival in the fishing village of **Urur-Olcott Kuppam(Tamil Nadu)** in an attempt to unite various art forms.
- He also organized a '**Nadaswaram and Thavil Festival**' in collaboration with Narada Gana Sabha.

About Sangeet Kalanidhi:

- **Sangeetha Kalanidhi** is the title awarded yearly to a **Carnatic musician by the Madras Music Academy**.
- The award is considered the highest accolade in the field of **Carnatic music**.

- The idea of the award was conceived in **1942 by the then Academy President KV Krishnaswami Iyer.**
- In 1942, it was decided that the musician so invited would be conferred the **title of Sangita Kalanidhi, the award comprising a gold medal and a birudupatra (citation).**
- On 1 January 1943, all musicians who had presided over the **annual conferences between 1929 and 1942 were awarded the title.**

Rising from the ashes

Section: Art and culture

Context:

- **Masaan Holi** is a **unique two-day festival** celebrated on various **ghats of Varanasi**, attracting **devotees worldwide.**
- It's known for its **distinctive blend of spirituality**, where **participants use ashes from funeral pyres and gual (pink powder)** during the **festivities**, symbolizing a **celebration of life and death.**

Details:

- The **festival is characterized by large processions** where **devotees dance, sing, and chant "Har-Har Mahadev"** while navigating through the narrow lanes of **Varanasi** to reach the ghats. The **air** during the celebration becomes **thick** with the **ashes and gual**, adding to the event's intense atmosphere.
- The event sees a **vibrant display of culture, tradition, and spirituality**, with devotees engaging in various activities—**singing, dancing, dressing up for processions, and participating in the evening aarti prayers.** The use of **ashes and gual** symbolizes the **festival's deep spiritual and cultural connotations.**

Varanasi as the Spiritual Hub:

- **Varanasi**, the **spiritual capital of India**, is famed for its **deep-rooted religious significance**, home to over **2,000 temples and ghats.**
- The city hosts **several rituals**, including the **evening aarti prayers** on the **banks of the Ganga**, drawing thousands of devotees seeking divine blessings and spiritual cleansing.
- **Modern Influence:** The impact of social media on the celebration was notably visible, with a **significant number of attendees capturing the event on their devices**, highlighting a **modern twist to the traditional festivities.**
- **Atmospheric Description:** **Masaan Holi** offers a **powerful experience**, not just through its **unique traditions** but also through the **immersive environment** created by the crowds, the **ritualistic use of ashes and gual**, and the overall fervent devotion of the participants, making it an **event of profound spiritual significance and communal celebration.**

The Archaeological Survey of India will 'delist' some 'lost' monuments. What's happening, and why?

Section: Art and culture

Context:

- The Archaeological Survey of India (ASI) has decided to delist 18 **"centrally protected monuments"** because it has assessed that they do not have national importance.

More on news:

- These 18 monuments are part of an earlier list of monuments that the **ASI had said were "untraceable".**
- Among the monuments that face delisting now are a medieval highway milestone recorded as **Kos Minar No.13 at Mujessar village in Haryana**, **Barakhamba Cemetery in Delhi**, **Gunner Burkill's tomb in Jhansi district**, a cemetery at **Gaughat in Lucknow**, and the **Telia Nala Buddhist ruins in Varanasi.**
- The precise location of these monuments, or their current physical state, is not known.

So what exactly does the "delisting" of monuments mean?

- The ASI, which works under the Union Ministry of Culture, is **responsible for protecting and maintaining certain specific monuments and archaeological sites that have been declared to be of national importance under the relevant provisions of The Ancient Monuments Preservation Act, 1904 and The Ancient Monuments and Archaeological Sites and Remains Act, 1958 (AMASR Act).**
- Delisting of a monument effectively means it will **no longer be conserved, protected, and maintained by the ASI.**
- Under the AMASR Act, **any kind of construction-related activity is not allowed around a protected site.**

- Once the monument is delisted, activities related to construction and urbanization in the area can be carried out in a regular manner.
- The list of protected monuments can grow longer or shorter with new listings and delistings.
- ASI currently has 3,693 monuments under its purview, which will fall to 3,675 once the current delisting exercise is completed in the next few weeks.
- **This is the first such large-scale delisting exercise in several decades.**

Section 35 of the AMASR Act:

- It says that if the Central Government is of opinion that any ancient and historical monument or archaeological site and remains declared to be of national importance, has ceased to be of national importance, it may, by notification in the Official Gazette, declare that the ancient and historical monument or archaeological site and remains, as the case may be, has ceased to be of national importance for the purposes of [the AMASR] Act.

And what does it mean when the ASI says a monument is “untraceable”?

- The AMASR Act protects monuments and sites that are more than 100 years old, including temples, cemeteries, inscriptions, tombs, forts, palaces, step-wells, rock-cut caves, and even objects like cannons and mile pillars (“kos minars”) that may be of historical significance.
- These sites are scattered across the length and breadth of the country and, over the decades, some, especially the smaller or lesser known ones, have been lost to activities such as urbanization, encroachments, the construction of dams and reservoirs, or sheer neglect, which has resulted in their falling apart.
- In some cases, there is no surviving public memory of these monuments, making it difficult to ascertain their physical location.
- Under the AMASR Act, the ASI should regularly inspect protected monuments to assess their condition, and to conserve and preserve them.
- In cases of encroachment, the ASI can file a police complaint, issue a show-cause notice for the removal of the encroachment, and communicate to the local administration the need for demolition of encroachments.
- The ASI, which was founded in 1861 after the need for a permanent body to oversee archaeological excavations and conservation was realized, remained largely dysfunctional in the decades that followed.
- The ASI also concentrated more on uncovering new monuments and sites, instead of conserving and protecting existing ones.

How many historical monuments have been lost in this way?

- In December 2022, the Ministry of Culture submitted to the Parliamentary Standing Committee on Transport, Tourism and Culture, that 50 of India’s 3,693 centrally protected monuments were missing.
- Fourteen of these monuments had been lost to rapid urbanization, 12 were submerged by reservoirs/ dams, and the remaining 24 were untraceable.
- The Committee was informed that security guards were posted at only 248 of the 3,693 protected monuments.
- **The Parliamentary panel said it was perturbed to find that the Barakhamba Cemetery in the very heart of Delhi was among the untraceable monuments.**

Was 2022 the first time that the disappearance of these monuments was noticed?

- In 2013, a report by the Comptroller and Auditor General (CAG) of India had said that at least 92 centrally protected monuments across the country had gone missing.
- The CAG report said that the ASI did not have reliable information on the **exact number of monuments under its protection.**
- It recommended that periodic inspection of each protected monument be carried out by a suitably ranked officer.
- **The Culture ministry accepted the proposal.**
- Eleven of these monuments are in Uttar Pradesh, two each in Delhi and Haryana, and others in states like Assam, West Bengal, Arunachal Pradesh, and Uttarakhand.

About Ancient Monuments and Archaeological Sites and Remains Act, 1958

- **The AMASR Act provides for preservation of ancient and historical monuments** and archaeological sites and remains of national importance.
- It provides for the regulation of archaeological excavations and for protection of sculptures, carvings and other like objects.
- The Archaeological Survey of India functions under the provisions of this act. The Archaeological Survey of India is the custodian of these monuments.

- The Act prohibits construction in ‘prohibited areas’, an area of 100 meters around protected monuments.
- It does not permit construction in such prohibited areas even if it is for public purposes, except under certain conditions.
- The central government can extend the prohibited area beyond 100 meters.
- The iconic monuments in India, Taj Mahal, Ajanta Caves, The Great Stupa at Sanchi and the Sun Temple of Konark, among others are designated as “ancient monuments of national importance” and protected under the AMASR Act.
- The National Monument Authority will make a recommendation for construction of public works to the central government, only if it is satisfied that there is no reasonable possibility of moving the construction outside the prohibited area.

About Archaeological Survey of India (ASI):

- ASI, under the Ministry of Culture, is the premier organization for the archaeological research and protection of the cultural heritage of the nation.
- **It was founded in 1861 by Alexander Cunningham– the first Director-General of ASI. Alexander Cunningham is also known as the “Father of Indian Archaeology”.**
- Its activities include carrying out surveys of antiquarian remains, exploration and excavation of archaeological sites, conservation and maintenance of protected monuments etc.

Kalamandalam opens doors for boys to learn Mohiniyattam

Section: Art and culture

- In a historic move, **the Kerala Kalamandalam, a deemed university for arts and culture, has lifted gender restrictions to learn Mohiniyattam.**

More on news:

- The admission for the Mohiniyattam course will be open from the next academic year onwards.
- The decision came in the wake of a controversy in which dancer Kalamandalam Sathyabhama made derogatory racial/casteist remarks against dancer R.L.V. Ramakrishnan.
- Kalamandalam provides an opportunity for learning Mohiniyattam up to the PG level.

About Mohiniyattam:

- Mohiniyattam is a **classical dance style from Kerala state** and one of the eight principal Indian classical dances.
- The Mohiniyattam is a popular dance form with a drama in dance, performed with subtle gestures and footwork.

Salient Features of the dance:

- Mohiniyattam is characterized by graceful, swaying body movements with no abrupt jerks or sudden leaps.
- It belongs to the **Lasya style which is feminine, tender and graceful.**
- The most characteristic element of the “form” component of Mohiniyattam is the circular or spiral movement of all the limbs of the body.
- This gives it a swaying effect which resembles the movement of a pendulum and thus it is called **aandolika**.
- The movements are emphasized by the glides and the up and down movement on toes, like the **waves of the sea and the swaying of the coconut, palm trees and the paddy fields.**
- Movements have been borrowed from **Nangiar Koothu and female folk dances Kaikottikali and the Tiruvatirakali.**
- The footwork is not terse and is rendered softly.
- Importance is given to the hand gestures and Mukhabhinaya with subtle facial expressions.
- Mohiniyattam lays emphasis on acting. The dancer identifies herself with the character and sentiments existing in the compositions like the Padams and Pada Varnams which give ample opportunity for facial expressions.
- The hand gestures, 24 in number, are mainly adopted from Hastalakshana Deepika, a text followed by Kathakali.
- **Few are also borrowed from Natya Shastra, Abhinaya Darpana and Balarambharatam.**
- The gestures and facial expressions are closer to the natural(gramya) and the realistic (lokadharmi) than to the dramatic or rigidly conventional (natyadharmi).
- Vocal music of this performance incorporates different rhythms and lyrics of many of the compositions performed in this dance form are in Manipravalam that is a mix of Sanskrit and Malayalam language while the music style is Carnatic.

- Instruments played during a **Mohiniyattam performance usually comprises Kuzhitalam or cymbals; Veena; Idakka, an hourglass-shaped drum; Mridangam, a barrel-shaped drum with two heads.**

Lalit Kala Akademi chief's powers curbed by Culture Ministry

Section: Art and culture

Context:

- In an unprecedented move, the **Ministry of Culture has curtailed the powers of the Lalit Kala Akademi (LKA) Chairman, V Nagdas, barring him from taking any “administrative actions”.**

More on news:

- **Lalit Kala Akademi (LKA) Chairman, is barred from taking any “administrative actions”,** including on matters related to “appointment, recruitment, transfer, disciplinary action and financial decisions”, without consulting the ministry.
- The order issued by the ministry on January 8, 2024, addressed to Nagdas, cites his failure to respond to an earlier “complaint” and also alleges non-compliance with the ministry’s “administrative directions”.

About Lalit Kala Akademi:

- **Lalit Kala Akademi (National Academy of Art), New Delhi was inaugurated on 5th August 1954** by the then Minister for Education, Maulana Abul Kalam Azad and was registered under the Societies Registration Act 1860, on 11th March 1957.
- **Lalit Kala Akademi, the youngest of the three Akademies founded by Govt. of India, establishes to direct its focus on activities in the field of Visual Arts.**
- LKA provides scholarships and a fellow program, and sponsors and organizes exhibitions in India and overseas. It publishes a bilingual journal.
- **It is funded by the Union Ministry of Culture.**
- Its headquarters are at Ravindra Bhawan, Ferozshah Road, New Delhi.

Other Academies under Ministry of Culture:

Sahitya Akademy:

- The Sahitya Akademy was formally inaugurated by the Government of India on 12 March 1954.
- Though set up by the Government, the Akademy functions as an autonomous organization.
- It was registered as a society on 7 January 1956, under the Societies Registration Act, 1860.
- Akademy gives 24 awards annually to literary works in the languages it has recognized and an equal number of awards to literary translations from and into the languages of India.
- Besides the 22 languages enumerated in the Constitution of India, the Sahitya Akademy has recognized English and Rajasthani as languages in which its programme may be implemented.
- The Sahitya Akademy award is the second-highest literary honor by the Government of India, after the Jnanpith award.

Sangeet Natak Akademy:

- Sangeet Natak Akademy, the apex body in the field of performing arts in the country, was set up in 1953 for the preservation and promotion of the vast intangible heritage of India’s diverse culture expressed in forms of music, dance and drama.
- The management of the Akademy vests in its General Council.
- The Chairman of the Akademy is appointed by the President of India for a term of five years. The functions of the Akademy are set down in the Academy's Memorandum of Association, adopted at its registration as a society on 11 September 1961.
- The registered office of the Akademy is at Rabindra Bhavan, 35 Feroze Shah Road, New Delhi. Sangeet Natak Akademy is an autonomous body of the Ministry of Culture, Government of India

National School Of Drama:

- The National School of Drama is one of the foremost theater training institutions in the world and the only one of its kind in India.
- It was set up by the Sangeet Natak Akademy as one of its constituent units in 1959.
- In 1975, it became an independent entity and was registered as an autonomous organization under the Societies Registration Act XXI of 1860, fully financed by the Ministry of Culture, Government of India.

Carnatic Music recent controversy

Section: Art and culture

Concept :

The history of the system of music that prevailed in India from ancient times, goes back to the Vedas. The Indian musical system shows to what heights the genius of man could soar in quest of new forms of musical expression. Apart from its entertainment value, music was cherished and practised for its quality of lifting mankind to a nobler plane, enabling the soul to attain eternal bliss. The perfect tone system and the extensive raga and tala systems of Indian music, make it comparable with any other sophisticated musical system of the world.

The earliest treatise we have on music is the Natya Sastra of Bharata. Other treatises on music after Bharata, such as the **Brihaddesi of Matanga, Sangeeta Ratnakara of Sharangadeva, Sangeet Sudhakara of Haripala, Swaramelakalanidhi of Ramamatya**, etc., provide us a fund of information about the different aspects of music and its development during the different periods.

The ancient Tamils of South India had also developed a highly evolved system of music with its solfa methods, concordant and discordant notes, scales and modes, etc. The Tamil classic of the 2nd century A.D. titled the **Silappadhikaram** contains a vivid description of the music of that period. The **Tolkappiyam, Kalladam** and the contributions of the **Saivite and Vaishnavite saints of the 7th and 8th centuries A.D.** also serve as resource material for studying musical history.

The course of the evolution of Indian music saw the emergence of two different sub systems as Hindustani and Carnatic music. In **Haripala's "Sangeeta Sudhakara"**, written in the 14th century A.D., the terms Carnatic and Hindustani are found for the first time.

- Carnatic music owes its name to the Sanskrit term KarnâtakaSangîtam which denotes "traditional" or "codified" music.
- Composed of a system of **Ragam (Raga)** and **Thalam (Tala)**, it has a rich history and tradition.
- Carnatic Sangeet has developed in the south Indian states of Tamil Nadu, Kerala, Andhra Pradesh and Karnataka. These states are known for their strong presentation of Dravidian culture.

Renaissance of Carnatic Music

- The course of the evolution of Indian music saw the emergence of two different subsystems as Hindustani and Carnatic music. Both the terms emerged for the first time in Haripala's "SangeetaSudhakara", written in the 14th century A.D.
- The two distinct styles, Hindustani and Carnatic came into vogue after the advent of the Muslims, particularly during the reign of the Mughal Emperors.
- **Purandardas (1484-1564)**, a prolific poet-composer and mystic of Vijayanagar, is considered to be the father of Carnatic music (**Carnatic SangeetaPitamaha**).
- **Venkatamakhi** is regarded as the grand theorist of Carnatic music. In 17th century AD, he developed "**Melakarta**", the system for classifying south Indian ragas. There are 72 Melakartas at present.
- Tyagaraja (1767-1847), his contemporaries **SyamaSastri** and **MuttusvamiDikshitar** are together known as the "Trinity" of Carnatic music.

Difference between Carnatic and Hindustani Music

- Carnatic music originated in South India whereas Hindustani music in North India.
- It is believed that the music of India was more or less uniform before the 13th century. Hindustani synthesises with Vedic, Islamic and Persian traditions. Carnatic is comparatively untouched and developed on the original lines.
- Carnatic music has homogenous and Hindustani music has a heterogeneous Indian tradition.
- Carnatic music has a restrained and intellectual character as compared with the more secular Hindustani traditions.
- The major vocal forms of Hindustani music are Dhrupad, Khayal, Tarana, Thumri, Dadra and Gazals. While Carnatic music has several varieties of improvisation such as Alapana, Niraval, Kalpnaswaram and Ragam Thana Pallavi.
- Hindustani music has various gharanas like Lucknow, Jaipur, Kirana, Agra etc., wherein Carnatic music no such gharanas found.

GITAM

Gitam is the simplest type of composition. The music of this form is a simple melodic extension of the raga in which it is composed. The tempo is uniform. It has no sections dividing one part of the song from the other. It is sung without repetition from the beginning to the end. There are no intricate variations in the music. The theme of the song is usually devotional, though there are a few gitas in praise of musical luminaries and Acharyas. A notable feature of the gitam is the existence of gitalankara phrases like a iya, a iyam, va iya, etc., called matrika padas, reminiscent of similar syllables occurring in Sama gana. Gitas have been composed in Sanskrit, Kannada and Bhandira bhasha. Purandaradasa's introductory gitas in praise of Ganesha, Maheswara and Vishnu, collectively referred to as Pillari gitas, form the very first set of gitas taught to the students of music. As distinguished from the type of gitas described above, known as

Lakshya gitas or Samanya gitas, which, as the name itself suggests, describe the Lakshanas of the raga in which they are composed. Paidala Gurumurti Sastry was a prolific composer of gitas after Purandaradasa. Venkatamakhi too has composed many Lakshana gitas.

SULADI

Very much like the gitam in musical structure and arrangement, the Suladis are of a higher standard than the gitam. The Suladi is a talamalika, the sections being in different talas. The sahitya syllables are fewer than in the gitas and there is a profusion of vowel extensions. The theme is devotional. Suladis are composed in different tempos vilambita, madhya and druta. Purandaradasa has composed many Suladis.

SSVARAJATI

This is learnt after a course in gitams. More complicated than the gitas, the Svarajati paves the way for the learning of the Varnams. It consists of three sections, called Pallavi, Anupallavi and Charanam. The theme is either devotional, heroic or amorous. It originated as a dance form with jatis (tala, solfa syllables like taka tari kita naka tatin gina tam) tagged on. But later, Syama Sastri, one among the Musical Trinity, composed svarajatis without jatis, which are brilliant concert pieces, noted for their musical value.

JATISVARAM

Very similar to the svarajati in musical structure, this form- Jatisvaram-has no sahitya or words. The piece is sung with solfa syllables only. It is noted for its rhythmical excellence and the jati pattern used in it. This is a musical form belonging to the realm of dance music. In some Jatisvarams, the Pallavi and Anupallavi are sung to jatis and the Charanas are sung to a mixture of svaras and jatis. There are also Ragamalika Jatisvarams.

VARNAM

The Varnam is a musical form in Carnatic Music. Whereas musical forms like the Kirtana, Kriti, Javali, Tillana, etc. have their similar counterparts in Hindustani Music, the Varnam does not find a counterpart. The Varnam is a beautiful creation of musical craftsmanship of a high order, combining in itself all the characteristic features of the raga in which it is composed. This form is aptly called a Varnam, since many of the svara group patterns called 'Varnas' in ancient music, are dexterously interwoven in its texture. Practice in Varnam singing helps a musician to attain mastery in presentation and command over raga, tala and bhava. The vocalist gets a good training for the voice and the instrumentalist a good mastery over technique. Very few words and profusion of vowels mark the sahitya of this form. The theme of the piece is either bhakti (devotion) or sringara (love).

KIRTANAM

The Kirtanam had its birth about the latter half of the 14th century. It is valued for the devotional content of the sahitya. Clothed in simple music, the kirtanam abounds in Bhakti bhava. It is suited for congregational singing as well as individual presentation. The Talapakam composers of the 15th century were the first to compose kirtanas with the sections, pallavi, anupallavi and charanas. Usually there are more than two charanas the music of all of them being the same. Composed in all the important traditional ragas and set to simple talas, the kirtanas offer soul-stirring music of the highest form of devotion. Bhadrachalam Ramadasa and Tyagaraja were prolific composers of Kirtanams.

KRITI

The Kriti is a development from the Kirtana. It is an highly evolved musical form. The highest limit of aesthetic excellence is reached in the Kriti composition. The raga bhava is brought out in all the rich and varied colours in this form. It was only after the emergence of the Kriti as a musical form, that a definite style in musical compositions became a possibility. The pallavi, anupallavi and charanam are the minimum and essential angas of a kriti. The pallavi is sung first, followed by the anupallavi and ends with the pallavi. The charanam is sung next and linked with the pallavi before ending. The Carnatic music world owes its debt of gratitude to the Musical trinity for having made such a monumental contribution in the field of nibaddha sangeeta, in the form of kritis. There are kritis in all the existing ragas and in all the principal talas. The kriti as a musical form has many features in common with the Dhrupad of Hindustani music. Muthuswamy Dikshitar has composed many kritis in the Dhrupad style.

PADA

Padas are scholarly compositions in Telegu and Tamil. Though they are composed mainly as dance forms, they are also sung in concerts, on account of their musical excellence and aesthetic appeal. A padam also has the sections, pallavi, anupallavi and charana. The music is slow-moving and dignified. There is a natural flow of music and, sustained balance between the words and the music is maintained throughout. The theme is madhura bhakti, portrayed as bahir sringara and antar bhakti. The characters nayaka, nayika and sakhi represent respectively the Lord (Paramatma), the Devotees (jeevatma) and the Guru, who leads the devotee on to the path of mukti (liberation) by his sage counsel. Various rasas are depicted in all their delicate shades, through suitable ragas which reflect such rasas. All the nava rasas are portrayed in padas, though sringara is the main theme.

JAVALI

A javali is a composition belonging to the sphere of light classical music. Sung both in concert programmes and dance concerts, the javalis are popular because of the attractive melodies in which they are composed. In contrast to the padas which portray divine love, javalis are songs which are sensuous in concept and spirit. They are generally set in madhyama kala. In these forms also, the nayaka, nayika and sakhi figure is the theme, but, there is no dual interpretation of the sahitya. The catchy and lilting tunes of the javalis enhance

their appeal. Desya ragas like Paraj, Kaphi, Behag, Jhinjhoti, Tilang, etc. have also been used in these compositions. Javalis are composed in Telugu, Kannada and Tamil. This form resembles the Thumris of Hindustani Music.

TILLANA

The Tillana, corresponding to the Tarana of Hindustani music, is a short and crisp form. It is mainly a dance form, but on account of its brisk and attractive music, it sometimes finds a place in music concerts as a conclusion piece. It usually begins with jatis.

The name Tillana is constituted of the rhythmic syllables, ti la na. It is the liveliest of musical forms. This form is said to have had its birth in the 18th century. The sahitya of a tillana may be in Sanskrit, Telugu or Tamil. The presence of rhythmical solfa syllables along with a sprinkling of sahitya enhance the beauty of the form of the Tillana. The music is of comparatively slow tempo in Tillanas meant for dance purposes. The pallavi and anupallavi consists of jatis and the charana has sahitya, jatis and svaras. Ramnad Srinivasa Iyengar, Pallavi Seshayyar and Swati Tirunal are some of the prominent composers of Tillanas.

PALLAVI

This is the most important branch of creative music. It is in this branch of manodharma sangeeta, that the musician has ample opportunities of displaying his or her creative talents, imaginative skill, and musical intelligence. The term Pallavi is coined from the initial syllables of the three words: Padam, meaning words; Layam, meaning time and Vinyasam, meaning variations. The words chosen for a Pallavi may be either in Sanskrit, Telugu or Tamil and may be on any theme, though the devotional is always preferred. Neither the sahitya nor the music is precomposed. The singer has the choice to choose the sahitya, the raga and the tala. The two parts Prathamangam and Dvityangam are divided by the period of a short pause, called Padagarbham. The sahityam is repeated again and again, as the musical variations develop and proceed in stages of increasing complexity. The Khyal of Hindustani music has very much in common with the Pallavi of Carnatic music. Kalpana svaras are sung to the Pallavi after the different stages of development, including the Sangatis, Anuloma and Pratiloma (singing the theme in double and quadruple speeds and vice-versa) are sung. Sometimes the kalpana svaras are sung in different ragas to present a Ragamalika Pallavi.

TANAM

This is a branch of raga alapana. It is raga alapana in **Madhyamakala** or medium speed. There is perceptible rhythm in this. The rhythmical flow of music, flowing in fascinating patterns, makes tanam singing the most captivating part of raga exposition. The word 'Anantam' is dexterously used to merge with the musical patterns.

T.M. Krishna | The dissident vocalist

Section: Art and Culture

Context:

- The Music Academy's award of the Sangita Kalanidhi to the vocalist T.M. Krishna has opened up rifts within the Carnatic music community, which have escalated into a war of positions on social media, with prominent artists, writers, celebrities, and political figures stating their sides, along with their reasons for doing the same.
- Critics of Krishna, irked as they are with his experimentation with Carnatic music and criticism of the community, were particularly aghast by a recent song he sang in praise of Periyar E.V. Ramasamy.

Idea of Music Academy:

- The idea of a Music Academy originally emerged in the **All-India Congress Session held in Madras in December 1927** as an institution that would set the standards for Carnatic music.
- It was **inaugurated the next year**.
- In **1929, it started hosting annual conferences on music**, which in turn spawned the December **music festival of Madras, known popularly as the Kutchery season**.

About Sangeet Kalanidhi:

- **Sangeetha Kalanidhi is the title awarded yearly to a Carnatic musician by the Madras Music Academy.**
- The award is considered the highest accolade in the field of **Carnatic music**.
- The idea of the award was conceived in **1942 by the then Academy President KV Krishnaswami Iyer**.
- In 1942, it was decided that the musician so invited would be conferred the title of Sangita Kalanidhi, the award comprising a gold medal and a birudupatra (citation).
- On 1 January 1943, all musicians who had presided over the annual conferences between 1929 and 1942 were awarded the title.

About Carnatic Music:

- **Purandaradasa (1484-1564)**, a prolific poet-composer and mystic of Vijayanagar, is considered to be the father of Carnatic music (**Carnatic Sangeetha Pitamaha**).
- **Venkatamakhi** is regarded as the grand theorist of Carnatic music.

- In the 17th century AD, he developed “Melakarta”, the system for classifying south Indian ragas. There are 72 Melakartas at present.
- **Tyagaraja (1767-1847)**, his contemporaries **SyamaSastri** and **MuttusvamiDikshitar** are together known as the “Trinity” of Carnatic music.
- Composed of a system of **Ragam (Raga)** and **Thalam (Tala)**, it has a rich history and tradition.
- Carnatic Sangeet has developed in the **south Indian states of Tamil Nadu, Kerala, Andhra Pradesh and Karnataka.**
- These states are known for their **strong presentation of Dravidian culture.**

Periyar:

- **Erode Venkatappa Ramasamy** was born in 1879 in Erode, then a part of the Coimbatore district of the Madras Presidency.
- He later came to be called “Periyar”, which in Tamil means ‘respected one’ or ‘elder’. He was also popularly referred to as **Thanthai Periyar.**
- He was a respected Indian social activist and politician who started the Self-Respect Movement and the political party DravidarKazhagam. He is also known as the ‘**Father of modern Tamilnadu**’.
- His works against the **Bhraminical dominance**, oppression of women in Tamil Nadu, caste prevalence are exemplary.
- Periyar promoted the principles of rationalism, self-respect, women’s rights and eradication of caste. He opposed the exploitation and marginalisation of the people of South India and the imposition of what he considered Indo-Aryan India
- In the year 1919, E.V. Ramasamy joined the Indian National Congress (INC) but resigned in 1925 when he started feeling that only the interests of the few elite sections of society were being catered to by the party.
- In 1924, Periyar participated in a non-violent satyagraha in **Vaikom in Kerala.**
- From 1929 to 1932, he travelled to British Malaya, Europe, and Russia which had a great influence on him.
- In 1939, E.V. Ramasamy became the head of the Justice Party, changed its name to DravidarKazhagam in 1944.
- The party later split with one group led by C. N. Annadurai forming the **DravidaMunnetraKazhagam (DMK)** in 1949.
- He advocated for a separate, independent “Land of Dravidians” – Dravida Nadu while continuing the **Self-Respect Movement**

Sabarmati Ashram Redevelopment Plan

Section: Modern India

Context:

- The redeveloped 'Kochrab Ashram' inaugurated by Prime Minister Narendra Modi in Ahmedabad.

More on news:

- **On March 12, marking the 94th anniversary of the Dandi March** that began from the Sabarmati Ashram, Prime Minister Narendra Modi performed the ‘Ashram Bhoomi Vandana’, a symbolic laying of the foundation stone, and unveiled the masterplan of the Rs 1,200 crore Gandhi Ashram Memorial and Precinct Development Project.

About Various Settlements:

- Gandhi set up five settlements during his lifetime — **two in South Africa (Phoenix Settlement in Natal, and Tolstoy Farm outside Johannesburg), where he lived from 1893 to 1914, and three in India, where he arrived in January 1915.**

Kochrab:

- Gandhiji set up the first ashram in **Ahmedabad in Kochrab in 1915.**
- **Gandhi's India ashram was originally established at the Kochrab Bungalow of Jivanlal Desai, a barrister, and friend of Gandhi, on 25 May 1915.** At that time the ashram was called the Satyagraha Ashram.

Sabarmati:

- In 1917, Gandhi founded the ashram at **Sabarmati — his fourth ashram — on the western bank of the Sabarmati River.**
- The location was to the north of the village of Juna Vadaj, beyond the **Chandrabhaga rivulet, a tributary of the Sabarmati.**
- He spent the most time here, and it was the cradle of eight major movements related to India’s struggle for independence.
- Apart from the Dandi March that Gandhi began from here on March 12, 1930, **he also launched the Champaran Satyagraha (1917), the Ahmedabad mills strike and Kheda Satyagraha (1918), the Khadi movement (1918), the Rowlatt Act and Khilafat Movements (1919), and the Non-Cooperation movement (1920) while living in Sabarmati.**

Sewagram:

- Sevagram (meaning "A town for/of service") is a town in the state of **Maharashtra, India**.
- It was the place of Mahatma Gandhi's ashram and his residence from 1936 to his death in 1948.
- After **Sabarmati, Sevagram Ashram** holds immense importance due to the residence of Mahatma Gandhi.

History of Sabarmati:

- The Sabarmati ashram is sited between a prison and a crematorium, and Gandhi believed that a satyagrahi has invariably to go to either place.
- At the **ashram, Gandhi formed a tertiary school** that focused on manual labor, agriculture, and literacy, in order to advance his efforts for the nation's self-sufficiency.
- It was also from here that on 12 March 1930, **Gandhi marched to Dandi, 241 miles** from the ashram, with 78 companions in protest at the British Salt Law, which increased the taxes on Indian salt in an effort to promote sales of British salt in India.
- This mass act of civil disobedience in turn led to the imprisoning of some 60,000 by the British Raj over the following three weeks.
- **Subsequently, the government seized the ashram.**
- On 12 March 1930, **Gandhi vowed that he would not return to the ashram until India had gained independence** and Gandhi did not come back to Sabarmati ashram.
- Gandhi was assassinated on 30 January 1948.

'Regrettable to criticize T M Krishna' says Tamil Nadu CM MK Stalin; derides criticism of Periyar by musicians

Section: Modern India (Personality)

Context:

- Tamil Nadu Chief Minister M K Stalin has publicly supported **Carnatic vocalist T M Krishna** amidst a controversy surrounding the **awarding of the Sangita Kalanidhi title** by the **Music Academy, Madras**. The issue has garnered political and social attention, especially concerning criticisms of the **social reformer E V R Periyar**.

Details:

- **Controversy Over Periyar:**
 - The controversy gained political dimensions when **singers Ranjani and Gayathri withdrew from the December music season, citing Krishna's praise of Periyar**—who they **inaccurately alleged advocated for genocide**—as a reason. This led to public backlash and discussions about **Periyar's views on equality and women's rights**.
- **Defense of Periyar:** Both **M K Stalin** and **DMK MP Kanimozhi Karunanidhi** defended **Periyar's legacy**, emphasizing his **lifelong dedication to social reform, equality, and women's rights**. They argued that a proper understanding of Periyar's work would counteract the criticism.
- **Broader Implications:**
 - This controversy reflects the broader tensions in **Tamil Nadu** and **Indian society** between **cultural appreciation** and **political ideologies**, especially in the context of **caste** and **social reform**.
 - It underscores the **challenges of maintaining cultural spaces free from political disputes** and **highlights the ongoing relevance of Periyar's legacy in contemporary debates**.

About E V Ramasamy 'Periyar':

- Born in **1879**, **E V Ramasamy 'Periyar'** is remembered for the **Self Respect Movement** to **redeem the identity and self-respect of Tamils**.
- **Periyar** started his political career as a **Congress worker**. He quarrelled with **Gandhi** over the question of **separate dining for Brahmin and non-Brahmin students**.
- He **resigned from the party in 1925**, and associated himself with the **Justice Party** and the **Self Respect Movement**, which **opposed the dominance of Brahmins in social life, especially the bureaucracy**.
- **Periyar's fame** spread beyond the **Tamil region** during the **Vaikom Satyagraha of 1924**, a **mass movement** to demand that **lower caste persons** be given the **right to use a public path** in front of the famous **Vaikom temple**. He would later be referred to as **Vaikom Veerar (Hero of Vaikom)**.
- In the **1940s**, **Periyar** launched a political party, **DravidarKazhagam (DK)**, which espoused an **independent Dravida Nadu** comprising **Tamil, Malayalam, Telugu, and Kannada speakers**.

- As a **social reformer**, he focused on **social, cultural** and **gender inequalities**, and his reform agenda questioned **matters of faith, gender and tradition**.
- **Periyar died in 1973** at the age of **94**. Over the years, **Periyar** is revered as **Thanthai Periyar**, the **father figure of modern Tamil Nadu**.

Dispersal out of Africa may have occurred during arid period

Section: Msc

Why in news: Recent Study Published in the Journal Nature suggest the most recent widespread migration of human out of Africa takes place less than 1,00,000 years, may have taken place during Arid period following Toba super volcano eruption in Indonesia

More About News:

- It was earlier believed that dispersal of Human out of Africa occurred during Humid period as it creates a **Green corridor** and facilitates the movement of people
- Period of Aridity are thought to have constrained human movement and creates food insecurity

New Evidence in support:

- **Near Shinfra River Evidence Human presence** in the form of **Chipped stone** from tool manufacturing and Animal remains and chemical analysis of Glass Shards found they were from Toba Super eruption (74000 years ago)
- Evidence from Ostrich Egg-Shells and fossil mammal teeth indicates that the environment at that time was particularly Arid

New Finding:

- With Increasing Aridity River Shrank in the dry season so fish were trapped easily in water holes by using bow and arrows
- Adaptive Forage along with Dry season Waterhole would have transformed seasonal river into blue highways , potentially facilitating out-of Africa dispersal
- Behavioral flexibility documented at this site helped these humans to survive aftermath of the super eruption and may play critical role for modern human to prosper in the diverse climates and habitats across the world

Union code 0001: How a village seeded India's White Revolution

Section: Post Independence India

Context:

- Amul, the renowned dairy cooperative, recently celebrated its **golden jubilee, marking fifty years of transformative impact in India's dairy industry**.

More on news:

- On October 31, 1964, the birthday of Sardar Vallabhbhai Patel, then Prime Minister Lal Bahadur Shastri inaugurated a 50-tonne-per-day cattle feed plant of the **Kaira District Co-operative Milk Producers' Union, better known as Amul**.
- It laid the basis for the **Operation Flood programme that helped turn India into the world's largest milk producer by 1998**.
- **Feed factory was opened in Kanjari, about 8 km from the cooperative's dairy in Anand**.
- Amul's top five DCSs ranked by average milk procurement in 2022-23 were **Badharpura (18,609 LPD), Undel (17,429 LPD), Bedva (12,173 LPD), Motipura (10,430 LPD) and Borsad (9,769 LPD)**. They are all much bigger than **Ajarpura**.

The start of a revolution:

- The National Dairy Development Board was established in **September 1965, with Shastri appointing Kurien as the chairman** of this organization having the mandate to replicate the "**Anand Pattern**".
- It laid the basis for the **Operation Flood programme that helped turn India into the world's largest milk producer by 1998**.
- **Ajarpura not only seeded the White Revolution**, it was the first Amul dairy cooperative society (DCS) to be registered on August 7, 1947, with a union code of "0001".

About White Revolution:

- In 1970, India set in motion the 'White Revolution', the world's biggest dairy development program, led by Dr. Verghese Kurien. 'Operation Flood'.
- White Revolution or Operation Flood, launched on 13 January 1970, was the world's largest dairy development program and a landmark project of **India's National Dairy Development Board (NDDB)**.

- It transformed India from a **milk-deficient nation into the world's largest milk producer, surpassing the United States in 1998 with about 22.29 percent of global output in 2018.**
- Within 30 years, it doubled the **milk available per person in India and made dairy farming India's largest self-sustainable rural employment generator.**

IR

India and South Africa block attempt to include 'investment facilitation for development' agreement at WTO meet

Section: Int Organisation

Context:

- Opposition to **Investment facilitation for development (IFD) Agreement at WTO's 13th Ministerial Conference.**

Details:

- The **13th Ministerial Conference (MC13)** of the **World Trade Organization (WTO)** took place in **Abu Dhabi**, starting on February 26 and concluding on February 29.

Investment Facilitation for Development (IFD) Agreement:

- The **IFD Initiative** was initiated in the spring of **2017** by **developing and least-developed WTO members.**
- Its goal is to **create a global agreement to enhance the investment and business climate, facilitating easier investment, daily business operations, and expansion for investors across all economic sectors.**
 - The agreement is **plurilateral**, based on the **most-favoured-nation principle**, and is **open for all WTO members to join. Plurilateral agreements are binding only on the WTO members** that accept them.
- Over **120 countries supported the IFD agreement, aiming to integrate it into the WTO to improve the investment and business climate.**
- The agreement, advocated by a **China-led group**, sought to be made **binding through Annexure-4** of the **WTO.**
- **Opposition by India and South Africa**
 - **India and South Africa** formally **opposed the IFD agreement's consideration at MC13**, labelling it a **non-trade issue outside the WTO's framework.**
 - **India** argued that **investment-related issues do not fall under the WTO's jurisdiction**, emphasizing that the **Marrakesh Agreement** requires **explicit consensus** for adopting **new plurilateral agreements.**
- **Consensus and Attempts to Persuade**
 - **South Korea**, a co-sponsor, acknowledged the need for consensus to incorporate the **IFD agreement.**
 - **Civil society organizations** reported efforts by the **WTO Secretariat** to persuade opponents to withdraw their objections.
 - **WTO Director-General Ngozi Okonjo-Iweala** mentioned the **IFD agreement** as a potential **"deliverable."**
- **India's Stance on Development Issues**
 - **India** emphasized the **importance of addressing issues relevant to developing countries**, insisting that new issues should not be considered unless previous decisions and mandates were fulfilled.
 - **India** defended the principles of '**Special and Differential Treatment**', asserting they are **fundamental** to the **WTO's objectives** and **not exceptions to its rules.**

2023 Was Deadliest Year for Migrants in A Decade: UN

Section: Int organisation

Context: As per the UN's International Organization for Migration the 2023 death count represents a tragic increase of 20 percent compared to 2022, highlighting the urgent need for action to prevent further loss of life. At least 8,565 people died on migration routes worldwide in 2023, making it the deadliest year since records began a decade ago

Why increase?

The IOM said that because safe and regular migration pathways remain limited, hundreds of thousands of people attempt to migrate every year via irregular routes in unsafe conditions.

The most unsafe migration route

- The **Mediterranean Sea**, where many migrants try to reach southern Europe from northern Africa, continues to be the deadliest route for migrants, with at least 3,129 deaths and disappearances registered last year.
- It is the highest number of deaths on the Mediterranean migration routes since 2017.

- In one incident alone an overcrowded trawler, the Adriana, sank off the coast of Greece in on June 14 last year, with the loss of more than 600 lives.
- Unprecedented numbers of migrant deaths were recorded last year across Africa (1,866) and Asia (2,138).
- In Africa, most of the deaths occurred in the Sahara Desert and the sea route to **Spain's Canary Islands**.
- In Asia, hundreds of deaths of Afghan and Rohingya refugees were recorded last year.
- Slightly more than half of the total migrant deaths in 2023 came as a result of drowning, with nine percent caused by vehicle accidents, and seven percent in violence

International Organization for Migration

- IOM is an **intergovernmental organization** that provides services and advice concerning migration to governments and migrants, including refugees, internally displaced persons and migrant workers.
- IOM was **established in 1951** as Intergovernmental Committee for European Migration (ICEM) to help resettle people displaced by World War II.
- It was granted **Permanent Observer status to UN General Assembly in 1992**.
- Cooperation agreement between IOM and the UN was signed in 1996.
- **World Migration Report is published every year by International Organization for Migration (IOM) of the UN.**
- IOM works in **four broad areas of migration management**:
 - Migration and development,
 - Facilitating migration,
 - Regulating migration and
 - Forced migration.
- It has **166 member states**, a further 8 states holding observer status and offices in over 100 countries.
- **India is a member of IOM.**

Missing Migrants Project

Missing Migrants Project records since 2014 people who die in the process of migration towards an international destination, regardless of their legal status. As collecting information is challenging, all figures remain undercounts. The locations in most cases are approximate. Each number represents a person, as well as the family and community that they leave behind.

Ensure Pakistan does not divert loans to foot defence bills: India to IMF

Section: Int organisation

Context: India stresses the need for stringent monitoring during a recent review of the IMF's ₹3 billion loan to Pakistan; new PM Shehbaz Sharif seeking additional funding support from the IMF.

The Stand-by Arrangement (SBA) provides short-term financial assistance to countries facing balance of payments problems. Historically, it has been the IMF lending instrument most used by advanced and emerging market countries. Through the years, the SBA has been upgraded to be more flexible and responsive to countries' needs.

Concept –

- The International Monetary Fund, or IMF, promotes international financial stability and monetary cooperation.
- It also facilitates international trade, promotes employment and sustainable economic growth, and helps to reduce global poverty.
- The IMF is governed by and accountable to its 190 member countries.

Primary aims:

- Promote international monetary cooperation;
- Facilitate the expansion and balanced growth of international trade;
- Promote exchange stability;
- Assist in the establishment of a multilateral system of payments; and
- Make resources available (with adequate safeguards) to members experiencing balance-of-payments difficulties.

- **Financial assistance:** Providing loans to member countries that are experiencing actual or potential balance-of-payments problems is a core responsibility of the IMF.
- **Surveillance:** In order to maintain stability and prevent crises in the international monetary system, the IMF monitors member country policies as well as national, regional, and global economic and financial developments through a formal system known as surveillance.
- **SDRs:** The IMF issues an international reserve asset known as Special Drawing Rights, or SDRs, that can supplement the official reserves of member countries participating in the SDR Department (currently all members of the IMF).
- **Resources:** Member quotas are the primary source of IMF financial resources. A member's quota broadly reflects its size and position in the world economy. The IMF regularly conducts general reviews of quotas.
- **IMF Members:** Any other state, whether or not a member of the UN, may become a member of the IMF in accordance with IMF Articles of Agreement and terms prescribed by the Board of Governors.
 - Membership in the IMF is a prerequisite to membership in the IBRD.

Governance and organization:

- The IMF is accountable to its member country governments.
- At the top of its organizational structure is the **Board of Governors**, consisting of one governor and one alternate governor from each member country, usually the top officials from the central bank or finance ministry.
 - The Board of Governors meets once a year at the IMF–World Bank Annual Meetings.
 - Twenty-four of the governors serve on the International Monetary and Financial Committee, or IMFC, which advises the IMF's Executive Board on the supervision and management of the international monetary and financial system.
- The day-to-day work of the IMF is overseen by its 24-member **Executive Board**, which represents the entire membership and supported by IMF staff.
- The **Managing Director** is the head of the IMF staff and Chair of the Executive Board and is assisted by four **Deputy Managing Directors**.
 - First Deputy Managing Director is the second top post in IMF next to the Managing Director.
 - The First Deputy Managing Director in the IMF takes lead on conducting surveillance, flagship publications and oversee researches

The IMF's various lending instruments are tailored to different types of balance of payments need as well as the specific circumstances of its diverse membership

- **General Resources Account-**All IMF members are eligible to access the Fund's resources in the General Resources Account (GRA) on non-concessional terms.

Funds for PRGT lending are obtained through bilateral loan agreements at market interest rates. Subsidy resources make up the difference between the market rates received by lenders and the concessional rates paid by LIC borrowers.

- **Poverty Reduction and Growth Trust-**concessional financial support (currently at zero interest rates) available through the Poverty Reduction and Growth Trust
- **Stand-By Arrangements (SBAs)-** in case of emerging and advanced market economies in crises, the bulk of IMF assistance has been provided through Stand-By Arrangements to address short-term or potential balance of payments problems.
- **Standby Credit Facility (SCF) -**Financing for LICs with actual or potential short-term balance of payments and adjustment needs caused by domestic or external shocks, or policy slippages—can also be used on a precautionary basis during times of increased risk and uncertainty.
- **The Extended Fund Facility (EFF) -**Fund's main tool for medium-term support to emerging and advanced countries facing protracted balance of payments problems
- **Extended Credit Facility (ECF)** for low-income countries are the Fund's main tools for medium-term support to countries facing protracted balance of payments problems
- **Flexible Credit Line (FCL) or the Precautionary and Liquidity Line (PLL)-**To help prevent or mitigate crises and boost market confidence during periods of heightened risks, members with already strong policies can use the Flexible Credit Line (FCL) or the Precautionary and Liquidity Line (PLL).
- **The Rapid Financing Instrument (RFI) –**for emerging and advanced countries provide rapid assistance to countries with urgent balance of payments needs, including from commodity price shocks, natural disasters, and domestic fragilities.
- **Rapid Credit Facility (RCF)-**Rapid financial support as a single up-front payout for low-income countries facing urgent balance of payments needs—possible repeated disbursements over a (limited) period in case of recurring or ongoing balance of payments needs.

- **Catastrophe Containment and Relief Trust**-In February 2015, the IMF repurposed the Post-Catastrophe Debt Relief Trust, into the Catastrophe Containment and Relief Trust. Under the new trust the IMF can join international debt relief efforts for poor countries hit by the most catastrophic of natural disasters. It can also assist countries battling public health disasters—such as infectious disease epidemics—with grants for debt service relief.

Call for Review of TRIPS Agreement: India's Joint Statement at WTO

Section: International organisation

Under 13th Ministerial Conference of the World Trade Organization (WTO) in Abu Dhabi, where the **temporary waiver of certain intellectual property rights (TRIPS) for Covid-19 related therapeutics and diagnostics was not extended**, India, along with Bangladesh, Colombia, and Egypt, has jointly called for a review of the TRIPS Agreement.

Objective of the Joint Call:

- The joint statement calls for a review of the TRIPS Agreement with a focus on the **development dimension, technology transfer, and other concerns of developing countries.**
- This review is intended to build on the lessons learned during the Covid-19 pandemic.

Key Points of the Submission:

1. **First Review under Article 71:**
 - The joint submission calls upon the Council for TRIPS to undertake its first review under **Article 71 on the implementation of the TRIPS Agreement.**
2. **Examination of TRIPS and CBD Relationship:**
 - India and other nations are pursuing the fast-tracking of the examination of the relationship between the **TRIPS Agreement and the Convention on Biological Diversity (CBD).**
 - The goal is to align the TRIPS Agreement with the CBD and create rules **that prevent bio-piracy and protect traditional knowledge.**

Background on TRIPS Agreement:

- The TRIPS Agreement, effective since January 1, 1995, **sets out the minimum standards of intellectual rights protection required by each WTO Member.**
- It provides guidelines for the **protection of various forms of intellectual property, including patents.**

Continuation of Work after MC13:

- **While the TRIPS waiver on vaccines was not extended to therapeutics and diagnostics at the WTO MC13**, the joint declaration emphasizes the need to continue work in relevant WTO bodies.
- The goal is to **review and build on the lessons learned and challenges experienced during the Covid-19 pandemic.**
- This effort aims to **develop effective solutions for future pandemics** in an expedited manner.

Conclusion:

India and its partner countries are advocating for a comprehensive review of the TRIPS Agreement to address the development concerns of developing nations, **ensure fair access to medicines and technology, and protect traditional knowledge.** The joint call reflects the ongoing efforts to align international trade rules with global health priorities and the needs of all member countries.

Key Outcomes of WTO's 13th Ministerial Conference (MC13):

1. **Accessions:**
 - Endorsed the **accession of Comoros and Timor-Leste**, bringing WTO membership to 166 countries.
2. **Reform of Deliberative and Negotiating Functions:**
 - Ministers welcomed efforts to **improve WTO Councils, Committees, and Negotiating Groups for efficiency and effectiveness.**
3. **Dispute Settlement System:**
 - Renewed commitment to **achieving a fully functional dispute settlement system accessible to all Members by 2024.**
4. **E-Commerce:**
 - Extended the e-commerce moratorium until MC14 or March 31, 2026.
5. **TRIPS Non-Violation and Situation Complaints:**
 - Extended the **moratorium on "non-violation" and "situation" complaints** under the TRIPS Agreement.

6. COVID-19 Related TRIPS Waiver:

- Took note of the lack of consensus on expanding **special rules for compulsory licenses to COVID-19 diagnostics and therapeutics.**

7. Special and Differential Treatment:

- Adopted a decision to **improve the use of S&D provisions**, especially in technical barriers to trade and sanitary measures.

8. Sustainability Initiatives:

- Worked on initiatives such as **Dialogue on Plastics Pollution and Fossil Fuel Subsidy Reform.**

9. Fisheries Subsidies:

- Welcomed progress towards the **Agreement on Fisheries Subsidies (AFS)** entry into force, with 71 Members ratifying the agreement.

Conclusion:

The WTO faces significant challenges in maintaining its relevance and effectiveness in the global trading system. **Key outcomes of MC13, such as agreements on e-commerce, fisheries subsidies, and sustainability initiatives, highlight progress amid complex trade dynamics. India's concerns, particularly in agriculture, market access, and IPR, reflect the diverse issues member countries navigate.**

Necessary reforms, **including dispute settlement revitalization, rule updates, and S&D enhancements, are crucial for the WTO to address current trade challenges and promote inclusive, sustainable global trade.** As the world economy evolves, the WTO must adapt to remain a central pillar of international trade governance.

Compulsory Licensing (CL) is a legal mechanism that allows **governments to grant licenses to third parties to produce, use, or sell a patented product or process without the consent of the patent holder.** This is typically done to address certain public interest concerns, **such as ensuring access to essential medicines, promoting competition, or addressing market failures.**

IMF's bailouts to Pakistan

Section: Int Organisation

• Amount and Agreement:

- Pakistan and the International Monetary Fund (IMF) **reached a preliminary agreement for the release of \$1.1 billion from a \$3 billion**
- The bailout was **approved by the IMF in July to save Pakistan** from defaulting on its debt repayments.
- Pakistan will receive the *final tranche* from the bailout under the new agreement.

• Approval Process:

- The IMF statement mentioned that the **agreement is reached.**

• Previous Bailout:

- Pakistan signed a short-term *agreement* last year to overcome an economic crisis.
- The **\$3 billion bailout was signed by former Premier Imran Khan** to address economic challenges.

• IMF's View:

- The IMF stated that **Pakistan's economic and financial position has improved in recent months.**
- However, it noted that **growth is expected to be modest, and inflation remains above target.**
- Ongoing *policy and reform efforts* are required to address Pakistan's economic vulnerabilities.

• Future Bailout:

- Pakistan has **expressed interest in receiving a new bailout of up to \$8 billion** when the current one expires **this month.**

• IMF Statement:

- The IMF mentioned that **Pakistan faces challenges from elevated external and domestic financing needs and an unsettled external environment.**

The agreement between Pakistan and the **IMF aims to address Pakistan's economic challenges and improve its financial stability.** The IMF highlighted the need for ongoing reforms and policy efforts to strengthen Pakistan's economic position.

What are IMF Bailouts?

- IMF bailouts are a **form of financial support extended to a country facing a potential threat of bankruptcy.**
- Support can take forms such as **loans, cash, bonds, or stock purchases.**

- It often comes with **greater oversight and regulations**.
- The IMF provides these packages to countries facing major macroeconomic problems, often currency crises.

Types of IMF Programs:

- **Stand-By Arrangements (SBAs):**
 - Short- to medium-term programs for **financial assistance to address balance of payments problems**.
- **Extended Fund Facility (EFF):**
 - Longer-term programs, usually **linked with structural reforms to address deep-seated economic issues**.
- **Structural Adjustment Programs (SAPs):**
 - Comprehensive reform programs **focusing on macroeconomic stabilization and structural adjustments**.

How is an IMF Bailout Provided?

- **Procedure:**
- IMF lends money, often in the form of **Special Drawing Rights (SDRs)**.
- SDRs represent a basket of major currencies.
- **Conditions:**
- Countries may need to implement **structural reforms** as a condition for receiving IMF loans.
- These reforms aim to address the **root causes** of the economic crisis.

Advantages of IMF Bailouts:

- Ensure **continued survival** of the country under difficult economic circumstances.
- Prevent collapse of **financial systems** and **critical industries**.
- IMF provides **technical assistance** for economic reforms and institution strengthening.

Disadvantages of IMF Bailouts:

- May lead to **reduced government spending** and increased taxes, causing **social unrest**.
- Seeking an IMF bailout can harm a country's **reputation** with investors and lenders.
- Creates a **dependency** on external funding, discouraging long-term reforms.
- Can be seen as an admission of **economic failure**, leading to political instability.

Sri Lanka likely to secure six-year moratorium, lower interest on debt owed to India, Paris Club

Section: Int organisation

Context: Sri Lanka is close to finalising a debt treatment plan with India and the Paris Club, sources familiar with the negotiations said, pointing to a likely moratorium of up to six years and a reduced interest rate during the repayment period

Understanding the Paris Club

- The Paris Club is a group of mostly western creditor countries that emerged from a 1956 meeting where Argentina agreed to meet its public creditors in Paris.
- It serves as a forum where official creditors meet to address payment difficulties faced by debtor countries.
- Objective: To find sustainable debt-relief solutions for nations struggling to repay bilateral loans.
- Members:
 - Includes countries such as Australia, Canada, France, Germany, Japan, the United States, and others.
 - All 22 members belong to the Organisation for Economic Co-operation and Development (OECD).
- Debt Agreements:
 - The Paris Club has reached 478 agreements with 102 debtor countries since its inception.
 - Total debt treated under these agreements is USD 614 billion since 1956.

Recent Developments and Sri Lanka's Debt Scenario

- Changing Landscape:
 - Paris Club countries were dominant in bilateral lending in the past century.
 - However, their significance has diminished in the last two decades with China emerging as the largest bilateral lender globally.

- Sri Lanka's Bilateral Creditors:
 - In Sri Lanka's case, the largest bilateral creditors include India, China, and Japan.
 - Sri Lanka owes 52% of its bilateral debt to China, 19.5% to Japan, and 12% to India.

Further developments

Meanwhile, Sri Lanka got a step closer to receiving the next instalment of the International Monetary Fund's assistance, as part of the \$3 billion package it obtained last year, to recover from the unprecedented financial crash witnessed in the island nation in 2022. Authorities reached a state-level agreement with the Fund on the second review of its four-year **Extended Fund Facility (EFF)** arrangement. Upon completion of the IMF Executive Board's review, Sri Lanka would have access to

about \$337 million, taking IMF assistance it has received so far to \$1 billion, the Fund said in a statement.

About Extended Fund Facility (EFF):

- It is a fund created by IMF for helping economies to address serious medium-term balance of payments problems because of structural weaknesses that require time to address.
- Assistance under an extended arrangement features longer program engagement to help countries implement medium-term structural reforms with a longer repayment period.
- It provides for support for comprehensive programs including the policies needed to correct structural imbalances over an extended period.
- Typically approved for periods of three years, but may be approved for periods as long as 4 years (repaid over 4.5–10 years in 12 equal semiannual installments unlike Stand-By Agreement facility which provides support for short period with repayment period of 3.5–5 years.)

Conditions to get help

- When a country borrows from the IMF, it commits to undertake policies to overcome economic and structural problems
- The IMF's Executive Board regularly assesses program performance and can adjust the program to adapt to economic developments.
- Lending is tied to the IMF's market-related interest rate, known as the basic rate of charge, which is linked to the Fund's Special Drawing Rights (SDR) interest rate.
- EFF is guided by a country's financing needs, capacity to repay, and track record with past use of IMF resources:
- Normal access: Borrowing under an EFF is subject to the normal limit of 145 percent annually of a country's IMF quota, (IMF quota broadly reflects a country's position in the global economy), and a cumulative limit over the life of the program of 435 percent of its quota, net of scheduled repayments.
- Exceptional access: The Fund may lend amounts exceeding these limits in exceptional circumstances provided that a country satisfies a predetermined set of criteria.

UN passes resolution calling for ceasefire in Gaza during Ramadan

Section: Int organisation

Context:

- The **United Nations Security Council on Monday** demanded a cease-fire in Gaza during the Muslim holy month of Ramadan, its first demand to halt fighting.

More on news:

- The United States abstained on the resolution, which also demanded the release of all hostages taken captive during **Hamas' Oct. 7 surprise attack in southern Israel**.
- The vote comes after **Russia and China vetoed a U.S.-sponsored resolution Friday** that would have supported "an immediate and sustained cease-fire" in the Israeli-Hamas conflict.
- Areas in news:

Gaza:

- The **Gaza Strip or simply Gaza, is a self-governing Palestinian territory**.
- It is located on the eastern coast of the **Mediterranean Sea, that borders Egypt on the southwest and Israel on the east and north border**.
- **Gaza and the West Bank are claimed by the de jure sovereign State of Palestine**.
- The territories of **Gaza and the West Bank are separated from each other by Israeli territory**.

- Both fell under the jurisdiction of the **Palestinian Authority**, but the strip has since the **Battle of Gaza** in June 2007 been governed by **Hamas, a Palestinian fundamentalist militant Islamic organization** which came to power in the last-held elections in 2006.
- It has been placed under an Israeli and US-led international economic and political boycott from that time onwards.



WTO's investment facilitation negotiations are not illegal

Section: Int organisation

Context:

- At the **13th Ministerial Conference** of the **World Trade Organization (WTO)** in **Abu Dhabi**, a significant event was the **failure to adopt the agreement on Investment Facilitation for Development (IFD)**.

Agreement on Investment Facilitation for Development (IFD):

- Initiated in **2017** by **70 countries** through the **Joint Statement Initiative**.
- **IFD agreement aimed to establish legally binding measures to improve investment flows.**
 - It also aims to create a **more investor-friendly business environment** by **simplifying investment procedures** and **promoting transparency** and **predictability** for **foreign direct investment (FDI)**, particularly in **developing** and **least-developed countries**.
- It notably **does not address market access, investment protection, or investor-state dispute settlement (ISDS)**.
 - **ISDS** allows **foreign investors to sue states**, is particularly **contentious** and **incompatible** with the **WTO's dispute resolution mechanism**, which is **limited to state-to-state claims**.

Investment facilitation and Investment promotion:

- The difference between **investment facilitation** and **investment promotion** is that promotion focuses on presenting a location as an attractive investment destination, while facilitation aims to simplify the process for foreign investors to establish or expand their businesses by addressing practical challenges they may face.

India's stance:

- Despite being supported by over **70% of WTO members** (around 120 of 166 countries) by November 2023, **opposition**, notably from **India**, **prevented its inclusion as a plurilateral agreement within Annex 4 of the WTO Agreement**.
- This development underscores the complexity of reaching consensus within the **WTO**, despite the provision under **Article II.3** that allows for **plurilateral agreements** which **bind only participating countries without affecting others**.

Why India is not supporting the IFD agreement?

- **India's** main argument **against the inclusion** of **investment** is that **investment is distinct from trade**; that is, **not all investment leads to cross-border trade**.

- This stance challenges the widely accepted economic view that **trade and investment are deeply intertwined**, as evidenced by the fact that **around 70% of international trade happens through global value chains, integrating both trade and investment activities.**
- **India's** reservations regarding the **Investment Facilitation for Development (IFD) Agreement** largely revolve around **two main issues.**
 - Firstly, there is a **fundamental concern** over **whether investment matters should fall within the World Trade Organization's (WTO) purview.**
 - Secondly, **India** is apprehensive about the **procedural aspects of incorporating the IFD agreement into the WTO rulebook.**
- The latter, allowing **foreign investors to sue states**, is particularly **contentious** and **incompatible** with the **WTO's dispute resolution mechanism**, which is **limited to state-to-state claims.**
- **India**, along with **South Africa**, has been pivotal in **preventing the IFD agreement from being integrated into the WTO framework**, reflecting broader concerns about the scope of the **WTO's mandate** and the **process for adopting new agreements.**

Significance of Plurilateral agreements:

- **Plurilateral agreements**, like the **IFD**, are seen by some as a way to break through the consensus deadlock that often hampers the **WTO's decision-making processes**, suggesting that embracing such agreements could be vital for the organization's relevance and effectiveness.
- This viewpoint argues for a **reconsideration of India's cautious stance on plurilateral agreements** within the **WTO**, especially given **India's growing economic significance.**

US court asks India to pay \$132 million to Deutsche Telekom in Devas Antrix case

Section: Int organisation

- The United States District Court for the District of Columbia confirmed a \$132-million award awarded to Deutsche Telekom against the Republic of India. The German company had petitioned the court to confirm this award even as India countered this petition to get the award dismissed.
- This was awarded by the United Nations Commission on International Trade Law arbitration, after it found that India was in violation of the bilateral investment treaty signed between Germany and India. The reason that India was found to be in violation of the treaty was the fact that it had the Indian government terminate a spectrum deal between state-owned Antrix and Devas in 2011. Deutsche Telekom was a shareholder in Devas.

United Nations Commission on International Trade Law

The **United Nations Commission on International Trade Law** is the core legal body of the United Nations system in the field of international trade law. A legal body with universal membership specializing in commercial law reform worldwide for over 50 years, UNCITRAL's business is the modernization and harmonization of rules on international business.

Many countries yet to fully implement steps to prevent misuse of virtual assets, says FATF

Section: Int Org

Context:

- The FATF plenary had in February 2023 agreed on a road map to strengthen the implementation of its standards **on virtual assets and VASPs.**

More on news:

- The Financial Action Task Force (FATF) has found that many countries are yet to fully implement its requirements aimed at preventing misuse of virtual assets and virtual asset service providers (VASPs).
- The table includes **all FATF members plus twenty jurisdictions with materially important VASP activity.**
- The countries which have explicitly prohibited the use of virtual assets and VASPs are **China, Egypt and Saudi Arabia, while it is in progress in Seychelles and Indonesia.**

About Virtual Assets:

- **Virtual assets (crypto assets) refer to any digital representation of value that can be digitally traded, transferred or used for payment.**

Status of India:

- **India, a member country**, has conducted a **supervisory inspection or included VASPs in its current inspection plan.**
- India has taken enforcement action or other supervisory action against VASPs; and has passed or enacted the travel rule for VASPs.

About FATF:

- **The Financial Action Task Force (FATF) is an inter-governmental body established in 1989 during the G7 Summit in Paris.**
- The objectives of the FATF are to set standards and promote effective implementation of legal, regulatory and operational measures for combating money laundering, terrorist financing and other related threats to the integrity of the international financial system.
- Its Secretariat is located at the **Organisation for Economic Cooperation and Development (OECD) headquarters in Paris.**

The Italian court ruling against returning sea migrants to Libya

Section: Int Conventions

Context:

- Italy's top court acknowledged that migrants face the risk of 'inhuman and degrading treatment' at detention centers should they be returned to Libyan coastguards.

More on news:

- Rights agencies have **drawn attention to human rights abuses** in Libyan territory, particularly in coastal prisons run by coastguards and armed militias, which become grounds for vast human trafficking networks.
- **Unprotected refugees and asylum seekers** are reportedly facing violence, torture, and inhumane conditions.
- **Groups like UpRights and StraLi welcomed the "landmark" ruling**, urging Italy to comply with international human rights standards and end its complicity with violations of migrants' rights.

The court cases

- The case in **question is a 2018 incident.**
- A lower **Italian court prosecuted the ship's captain in 2021**, finding him guilty of violating international humanitarian and refugee laws.
- The principle of **non-refoulement forbids the forced return of people to countries where their lives or rights are at risk.**
- As per international law, **Libya is currently not a port of safety.**
- The court said that once picked up, the migrants were under the captain's charge, and in 'abandoning' them, the captain violated directives of the **International Maritime Organization and the International Convention for the Safety of Life at Sea (SOLAS).**

What are the legal obligations in handling rescues at sea?

- The expanse of the **Mediterranean Sea between Libya and Italy** is among the most dangerous albeit oft-used passage for migrants from sub-Saharan Africa fleeing ethnic conflict, war and famine.

About Article 98 of the United Nations Convention on the Law of the Sea:

- **Under Article 98 of the United Nations Convention on the Law of the Sea**, every shipmaster is required "to render assistance to any person found at sea in danger of being lost."
- International maritime law also requires coastal states to conduct search and rescue services, and if needed, coordinate with other nations during these operations.

Some facts about Libya:

- **Libya** is a country in the Maghreb region of **North Africa.**
- It borders the **Mediterranean Sea to the north, Egypt to the east, Sudan to the southeast, Chad to the south, Niger to the southwest, Algeria to the west, and Tunisia to the northwest.**
- **Tripoli** is the capital of **Libya.**
- **Libya** had the largest proven crude oil reserves in **Africa.**

Yaounde Declaration: Health ministers of 11 African countries commit to end malaria deaths

Section: Int Conventions

Context:

- In a historic meeting in **Yaoundé, Cameroon**, **African health ministers** and **key malaria stakeholders** committed to **ending malaria deaths**, acknowledging the **urgent need given the availability of tools and systems**.

Yaounde Declaration:

- **Malaria cases globally rose from 233 million in 2019 to 249 million in 2022**, with **Africa** experiencing an **increase from 218 million to 233 million cases**, highlighting its status as the **epicentre of the malaria crisis**.
- The **11 participating African countries (Burkina Faso, Cameroon, Democratic Republic of the Congo, Ghana, Mali, Mozambique, Niger, Nigeria, Sudan, Uganda, and Tanzania)** account for over **70% of the global malaria burden**.
- The **Yaoundé Declaration** reflects an **"unwavering commitment"** to fight **malaria**, including a **pledge by African heads of state to allocate 15% of their annual budgets** to health sector strengthening.
- **Key focuses** include **addressing root causes of malaria stagnation**, enhancing **health infrastructure and personnel capacity**, fostering **multi-sectoral collaboration**, and holding countries accountable for their commitments.
- Despite the declaration's lack of new commitments and specific targets, it marks a significant milestone in the **fight against malaria**.
- The **African Union aims to control and eliminate malaria by 2030**, but progress has **fallen short of interim goals**, with significant financial gaps hindering efforts.
- The continent requires **\$1.5 billion to sustain basic malaria services** and an additional **\$5.2 billion annually** for progress towards elimination, plus **\$11 billion annually for climate adaptation in the health sector**.

About Malaria:

- Caused by the **Plasmodium parasite**.
- The parasite is **spread to humans through the bites of infected mosquitoes**. People who have malaria usually feel very sick with a high fever and shaking chills.
- Once the parasites enter the human body, they travel to the **liver** — where some types can lie dormant for as long as a year.
- When the **parasites mature**, they **leave the liver and infect your red blood cells**. This is when people typically develop malaria symptoms.
- **Disease-causing Microbes:**
 - **5 Plasmodium parasite species** cause malaria in humans.
 - **falciparum** and **P. vivax** pose the **greatest threat**.
 - **falciparum** – deadliest malarial parasite and the most prevalent on the **African continent**. 95% of all cases of **P. falciparum** occur in the **African region** and are associated with severe disease and disease-associated mortality.
 - **P. vivax** – geographically most widespread in **tropical and subtropical regions**. Dominant in most countries outside of sub-Saharan Africa
 - **Other 3 Plasmodium species** infecting humans – **P. malariae, P. ovale and P. knowlesi**.

India-EFTA Trade and Economic Partnership Agreement

Section: Trade

Duties Phased Out:

- Duties on a substantial number of goods imported from **EFTA countries (Switzerland, Norway, Iceland, and Liechtenstein)** will be phased out by India under the agreement.

Offered Tariff Lines:

- India is offering 82.7% of its tariff lines, covering 95.3% of EFTA exports. **More than 80% of this import is gold.**

Sensitivity Consideration:

- Sensitivity related to **Production-Linked Incentives (PLI) in sectors such as pharmaceuticals, medical devices, and processed food have been considered** while extending offers.

Exclusion List:

- Sectors such as dairy, soya, coal, and sensitive agricultural products are kept on the exclusion list.

Immediate Elimination of Tariffs:

- Coal (except steam and coking coal), most medicines, dyes, most textiles and apparel, and iron and steel products will have **zero tariffs immediately** upon the entry into force of the FTA.

Gradual Elimination of Tariffs:

- Tariffs on various products will be **eliminated over different time frames:**

- Cod liver oil and fish body oil: Five years
- Tuna, trout, salmon, olive oil, cocoa bean, powder, malt products, corn flakes, instant tea, roasted chicory, most machinery, bicycle parts, clocks, and watches: Seven years
- Smartphones, chocolates, medical equipment (most), chocolate, caramel, coffee, avocado, apricot, and olives: Ten years

Exclusive Duty Cut Offers:

- **Some duty-cut offers are exclusive to Switzerland** due to its status as the largest trade partner among the EFTA countries.

Duty Cuts on Wines:

- Duty cuts on **wines from Switzerland will align mostly with concessions extended to Australia** under the **Australia-India Economic Cooperation and Trade Agreement**.

Tariff Cuts in Sugar and Diamonds:

- India commits to a **50% tariff reduction in sugar over ten years and a 50% tariff reduction for cut and polished diamonds to 2.5%** in five years.

Industrial Products:

- 98% of India's exports to Switzerland (accounting for 70% of India's exports to EFTA) are industrial products, which will now be imported duty-free.

Agricultural Exclusions:

- Switzerland has excluded **most agricultural items such as dairy products, honey, various vegetables, wheat, maize flour, and cane sugar from these concessions**.

Conclusion:

The India-EFTA Trade and Economic Partnership Agreement aims to **gradually eliminate tariffs on a wide range of goods traded between India and EFTA countries**. This move is expected to boost trade relations, create new market opportunities, and **promote economic cooperation between the parties involved**.

Highlights of the TEPA:

- **Scope of the Agreement:**
 - The TEPA covers a wide range of areas **including tariff reductions, increased market access, and streamlined customs procedures**.
 - It includes a chapter on commitments to **human rights and sustainable development, a first for an FTA involving EFTA countries**.
- **Goal of \$100 Billion Investment:**
 - Commerce Minister stating that it **includes a "binding commitment" for EFTA countries to invest \$100 billion in India**.
 - However, EFTA ministers clarified that this **commitment is a "goal" based on current investment levels, GDP projections, and the estimated value of the TEPA**.
- **Investment Promotion:**
 - The **TEPA's Chapter 7** focuses on "**Investment Promotion and Cooperation**," outlining shared objectives to **increase foreign direct investment (FDI) from EFTA states into India**.
 - Aims include \$50 billion increase in FDI within 10 years and another \$50 billion in the subsequent five years.
 - Additionally, the **agreement targets the generation of 1 million jobs in India resulting from these investments**.

Negotiation and Ratification:

- **Extensive Negotiations:**
 - Talks for the India-EFTA FTA began in 2008, with a significant break before resuming in 2023.
 - The 14-chapter treaty was concluded after 21 rounds of negotiations, **covering crucial areas such as investment, rules of origin, intellectual property rights (IPR), and sustainable development**.
- **Expected Ratification:**
 - The agreement will come into force after ratification by EFTA states through their parliamentary procedures, expected possibly by the end of the year.

Significance and Implications:

- **Export Boost:**

- India anticipates a significant increase in exports to EFTA countries, **especially in sectors such as textiles, leather, gems, and jewelry.**
- Reduction of tariff disadvantages will enhance **India's competitiveness in the EFTA market.**
- **Cheaper Raw Materials:**
 - Indian industries will benefit from access to cheaper raw materials from **EFTA countries, particularly in sectors like steel, aluminum, and engineering.**
- **Strengthening Indo-Pacific:**
 - The TEPA contributes to a **stronger Indo-Pacific economic architecture, fostering cooperation and capacity-building among nations.**

Controversies and Concerns:

- **Pharma Clause Dispute:**
 - The inclusion of a "**data exclusivity**" clause for pharmaceuticals was a point of contention.
 - Indian negotiators rejected this clause, citing concerns over access to generic medicines and patient rights.
- **IPR Review Mechanism:**
 - The TEPA includes a review mechanism for **intellectual property rights, which some activists fear could pressure India into adopting stricter measures.**
- **Assessment and Monitoring:**
 - Continuous monitoring through the **Joint EFTA-India Committee will ensure progress towards investment and job creation goals.**
 - India retains the option to withdraw trade concessions temporarily if targets are not met within the stipulated timeframe.

What is Data Exclusivity?

Data exclusivity is a provision within trade agreements that imposes a specific period during which the clinical trial data for a drug developed by a pharmaceutical company is protected from use by competitors. This protection means that generic drug manufacturers cannot rely on the original clinical trial data to support their own applications for market approval during this exclusivity period.

Key Features:

- **Duration:** The duration of data exclusivity can vary but typically ranges from 5 to 10 years.
- **Purpose:** It is intended to reward innovation by providing a period of market exclusivity to the originator company, during which they can recoup their investment in research and development without competition from generic versions of the drug.
- **Impact:** Data exclusivity can delay the entry of generic versions of drugs into the market, which may limit competition and keep prices higher for consumers.

Impact on India's Generic Drug Industry:

- **Affordability of Medicines:** India's generic drug industry is renowned for providing affordable medications, not only to its own population but also to many countries around the world. Data exclusivity could hinder the availability of these cost-effective alternatives.
- **Competition and Innovation:** By delaying the entry of generic versions, **data exclusivity may reduce competition in the pharmaceutical market.** This could potentially stifle innovation and limit patients' access to newer treatments.

Experts report Nicaraguan 'systematic human rights violations' to UN council

Section: Places in news

Context:

- **Nicaragua has jailed hundreds** of real and perceived opponents since then and shuttered more than 3,500 religious and other NGOs, often also seizing their assets.

More on news:

- **Managua** views the 2018 protests as part of an attempted coup promoted by Washington, and claims they were funded by NGOs.
- In a report presented to the **UN's Human Rights Council (HRC) in Geneva**, said that the President, Vice President and other high-level officials should be held accountable.

About Nicaragua:

- Nicaragua, officially the **Republic of Nicaragua, is the largest country in Central America.**
- The country is bordered by **Honduras to the north, the Caribbean to the east, Costa Rica to the south, and the Pacific Ocean to the west.**
- Managua is the **country's capital and largest city.**
- As of 2015, it was estimated to be the **third largest city in Central America.**

About the United Nations Human Rights Council (UNHRC):

- The **UNHRC describes itself as an inter-governmental body within the UN system** responsible for strengthening the promotion and protection of human rights around the globe.
- It addresses situations of **human rights violations and makes recommendations on them.**
- The UNHRC has the **ability to discuss all thematic human rights issues and situations that require its attention throughout the year.**
- The UNHRC replaced the **former United Nations Commission on Human Rights (UNCHR).**
- **UNHCR's headquarters is located in Geneva.**
- **The organization employs over 10,966 staff in more than 130 countries, including the Republic of Korea.**

How the development of Agaléga figures in India's vision for its maritime neighborhood

Section: Places in news

Context:

- Prime Ministers Narendra Modi and Pravind Jugnauth jointly inaugurated an **airstrip and the St James Jetty on North Agaléga Island in the Indian Ocean.**

More on news:

- The development of the **Agaléga Islands is in the socio-economic** and national security interest of Mauritius, and also aligns with India's maritime vision.

Why is Agaléga important to Mauritius?

- **The islands, which is a dependency of Mauritius,** were not developed for many years.
- The **near absence of an official government or security presence** was a serious vulnerability for Mauritius.
- This vulnerability could be converted to strength by developing the islands and creating facilities that could operate ships and aircraft.
- Building a jetty and an airstrip was therefore considered imperative by the government of Mauritius.
- They chose India as their preferred development partner.

Why did Mauritians choose India?

- Ties between **India and Mauritius go back to 1948, 20 years before the country's independence** from Britain.
- **Seventy per cent of the inhabitants of Mauritius are of Indian origin,** and the two countries share deep historical, social, and cultural bonds.
- Considering the sensitivities in Mauritius over issues of sovereignty and security, both sides progressed with utmost caution, and every concern was appropriately addressed before the project got off the ground.

How will the development of Agaléga help Mauritius?

- The new jetty and airstrip will enable a larger and more credible government presence on the islands, and the stationing or **forward deployment of ships of the Mauritius Coast Guard.**
- It will be possible to better monitor and police the vast **Exclusive Economic Zone (EEZ) that extends 200 nautical miles outward from these islands.**

What is in it for India?

- The joint development of Agaléga underscores India's commitment to the vision of **Security And Growth for All in the Region (SAGAR),** and its willingness to assist smaller maritime nations in building capacity and developing capability.
- It will indicate to other maritime neighbors that India is a **benign and friendly country that respects the sovereignty of independent nations.**

- India would like to emerge as the preferred development and security partner in the Indian Ocean Region.

About Agalega Islands:

- **Agaléga is a group of two islands** with a total area of 26 sq km and a native population of about 300 people.
- It lies approximately 650 nautical miles (1,050 km) **north of Mauritius, and belongs to the island nation.**
- **Agaléga is a dependency of Mauritius** which consists of two outer islands located in the Indian Ocean, about 1,050 km (650 mi) north of Mauritius Island.
- Agalega is explicitly defined by the **Constitution of Mauritius, part of the Sovereignty of Mauritius**, together with the following islands **Rodrigues, Tromelin, Cargados Carajos (Saint Brandon), Chagos Archipelago, Diego Garcia and other islands included in the State of Mauritius.**



Rajya Sabha member, team meet rebel Arakan Army inside Myanmar, discover poor condition of Kaladan project on Myanmar side

Section: Places in news

Context:

- An **Indian delegation**, led by **Rajya Sabha member K. Vanlalvena**, engaged in talks with the **Arakan Army** within Myanmar, weeks after the **rebel group captured a crucial township** near the **Indian border**.

details:

- The meeting **aimed** to discuss the status of the **Kaladan Multi-Modal Transit Transport Project**, a **\$484 million connectivity initiative** designed to enhance **overland and water connectivity** between **India and Southeast Asia**.
- **Key Discussions:**
 - The dialogue with the **Arakan Army** focused on **two main issues: the refugee problem** affecting the region and the **progress of the Kaladan project**.
- **Security and Autonomy Concerns:**
 - The situation indicates a loss of control by the **Burmese military** in the area, highlighting the influence of various rebel groups over approximately forty per cent of Myanmar's territory.
- **Strategic Implications:**

- The **Kaladan project** is strategically important for connecting **India's northeastern region to Southeast Asia**, potentially enhancing commercial prospects through the **port of Sittwe**.
- The engagement with the **Arakan Army**, a **non-state actor** with growing influence, raises questions about the future legal status of the Kaladan project amid Myanmar's complex political landscape.

About Kaladan Multi-Modal Transit Transport Project:

- **Kaladan Project** would link **India and Myanmar** via the **Bay of Bengal**.
- It was **jointly identified** by **India and Myanmar** to create a **multi-modal mode of transport** for the shipment of cargo from the **eastern ports of India to Myanmar** as well as to the **North-Eastern part of India through Myanmar**.
- It is being constructed by **India** under the **Grant in Aid Scheme**.
- Once completed, it will link **Kolkata** with the **Sittwe seaport** in **Rakhine state** in **Myanmar**, primarily over the **Bay of Bengal** – covering over 500 km.
- **The project envisaged four important stages:**
 - Kolkata to Sittwe waterway;
 - Sittwe to Paletwa inland (River Kaladan) waterway;
 - Paletwa to India-Myanmar border post in Myanmar;
 - Finally, linking the road to Lawngtlai in Mizoram as part of the project's last leg;
- **Benefits:**
 - The project is expected to contribute to the economic development of the North-Eastern States of India.
 - It also provides a strategic link to the North-East, thereby reducing pressure on the Siliguri Corridor.



Places in news:

- **Paletwa township**- a part of Myanmar (border to India) currently controlled by the Arakan Army.
- **Port of Sittwe**- A port of **Myanmar** and a part of the **Kaladan Project**.

Sudanese seek alternatives as civil war hits fuel supply

Section: Places in news

Sudan has been rocketing by a brutal civil war that has killed thousands — including up to 15,000 in a single **Darfur town**, according to UN experts — and **displaced millions since last April**.

Details: Covered before



Haitian crisis

Section: Places in news

Context: Doctors Without Borders (MSF) announced Wednesday it was boosting its presence in the Haitian capital following a surge in casualties linked to the worsening violence engulfing **Port-au-Prince**.

Armed groups have mounted a coordinated effort to oust Prime Minister Ariel Henry -- who was supposed to step down last month -- with Port-au-Prince's airport, prisons, police stations and other strategic targets coming under attack.

The gang leader behind the violence blighting the Haitian capital has warned there will be a "civil war" if Haiti's Prime Minister, Ariel Henry, does not step down.

Jimmy "Barbecue" Chérizier made the threat as members of his gang tried to seize the capital's airport to stop Mr Henry from returning from abroad.

Haiti:

- **Population:** 11.5 million (estimate)
- **Area:** 27,800 sq km (slightly smaller than Belgium, about the same size as the state of Maryland in the US)
- **Location:** Caribbean country sharing a border with the Dominican Republic
- **Languages:** French, Haitian Creole

EU will open sea corridor to send aid from Cyprus to Gaza amid famine fears

Section: Places in news

Context:

- The EU has announced the **imminent opening of a sea corridor from Cyprus to Gaza, aiming to prevent a famine** that has already begun to claim lives.

Amalthea Initiative:

- Started under the leadership of **Cyprus**.
- **Aim:** To establish a mechanism for **securely shipping aid from Cyprus to Gaza via sea**.
- The **international backing for this corridor** includes a **coalition of countries** and **aims to tackle the complex logistics of delivering aid directly to Gaza by sea**.
- This **corridor** is seen as a vital step in delivering **humanitarian aid directly to Gaza**, about **210 nautical miles away from Cyprus**.
- The **initiative's** launch is marked by a pilot delivery conducted by the **Spanish** search and rescue group **Open Arms**, with food supplied by **World Central Kitchen**.
- While the EU has detailed the **shipments' direct route to Gaza**, specifics on landing points, unloading, and food distribution remain unclear.



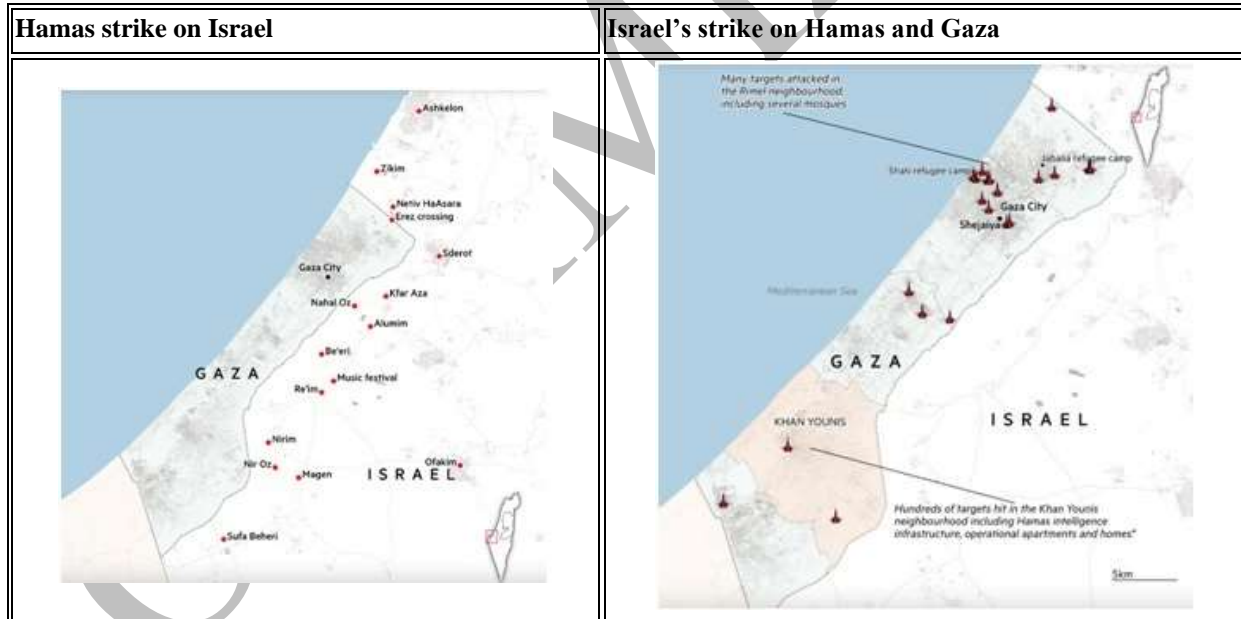
The U.S. initiative:

- This initiative appears separate from a **US plan** announced by President Joe Biden to **construct a floating dock near Gaza for aid delivery**, a plan that has faced criticism from aid workers for its feasibility and timeline.
- Amidst this effort, the **UK** has urged **Israel** to **allow more trucks into Gaza**.
- This initiative comes as the **humanitarian situation in Gaza worsens**, with **30,000 Palestinians** reported **dead** since the start of the war, and parts of **Gaza**, especially the north, facing **famine conditions**.

Cyprus:

- It is an **island country** located in the **eastern Mediterranean Sea**, north of the **Sinai Peninsula**, south of the **Anatolian Peninsula**, and west of the **Levant**.
- It is **geographically** a part of **West Asia**, but its **cultural ties** and **geopolitics** are overwhelmingly **Southeast European**.
- **Cyprus** is the **third-largest** and **third-most populous island** in the **Mediterranean**.
- It is located **east of Greece**, **north of Egypt**, **south of Turkey**, and **west of Lebanon and Syria**.
- Its capital and largest city is **Nicosia**. The northeast portion of the island is de facto governed by the self-declared **Turkish Republic of Northern Cyprus**.

Israel- Hamas conflict through map:



Burkina Faso youth join fight to end female genital mutilation

Section: Places in news

Youngsters in Burkina Faso are joining the state in the fight against female genital mutilation (FGM) as population displacement caused by jihadist violence threatens significant progress made over the last decade. Cases of FGM have been recorded in areas to where people affected by the violence have fled.

Since 2015, almost 20,000 people have died in the unrest and more than two million been displaced in the Sahel nation of 23 million inhabitants, the majority of whom are women

What is Female genital mutilation (FGM)?

- Female genital mutilation (FGM) comprises all procedures that involve partial or total removal of the external female genitalia, or other injury to the female genital organs for non-medical reasons. The practice has no health benefits for girls and women and cause severe bleeding and problems urinating, and later cysts, infections, as well as complications in childbirth and increased risk of newborn deaths.

Burkina Faso

It is a landlocked country in West Africa, is known for its rich cultural heritage, diverse landscapes, and struggles with poverty and political instability.

Bordering countries

- Mali to the northwest
- Niger to the northeast
- Benin to the southeast
- Togo and Ghana to the south
- Ivory Coast to the southwest

Humanitarian crisis in Haiti as the Caribbean's most populous country may have fallen to armed gangs

Section: Places in news

Context:

- **Haiti, the Western Hemisphere's poorest country and the Caribbean's most populous nation** may have been overtaken by criminal gangs, leading to the evacuation of US embassy staff from Port-au-Prince by the United States Marine Corps, as reported by the Miami Herald.

Details:

- Haitians can't lead a decent life, and live in fear, and the capital is essentially under siege by armed groups.
- **UN High Commissioner for Human Rights** warned that the world was 'running out of time' to act on **Haiti's crisis**.
- **Armed gangs, growing stronger** since the **2010 earthquake**, launched an offensive on February 29 to **overthrow Prime Minister Ariel Henry's government**, targeting hospitals, prisons, and transportation hubs.

A country in turmoil- Haiti:

- **Haiti** shares the island of **Hispaniola** in the **Caribbean Sea** with the **Dominican Republic**.
- Named **Ayiti** by its **Taino natives**, **Haiti** was the **site of Columbus's first settlement in the Americas, La Navidad**, founded in **1492**.
- Formerly a **French colony** known as **Saint-Domingue**, **Haiti** became **Latin America** and the **Caribbean's first independent country**, the **world's first free black republic**, and the **second republic in the Western Hemisphere** after the **US**, following the **Haitian Revolution (1791-1804)** led by **Toussaint Louverture**.
- **Post-independence**, **Haiti** was forced to pay **France 150 million francs** as "**reparations to French slaveholders**," a debt cleared over **122 years**.
- The **20th century** saw a **19-year US occupation** and political interference, including support for the **Duvalier Dynasty** and the **ousting of Haiti's first democratically elected president, Jean-Bertrand Aristide**.
- Since the devastating **2010 earthquake**, **Haiti** has struggled with **political instability** and **leadership issues**, with successive leaders using armed gangs as private militias, which have now become powerful and uncontrollable.
- In **2021**, **President Jovenel Moïse** was **assassinated**, and his successor, **Ariel Henry**, faced threats of overthrow.
- The ongoing unrest has led to the **internal displacement of 362,000 Haitians**, over half of whom are **children**, with more than **160,000 people displaced** in the **Port-au-Prince** metropolitan area alone, as reported by the **International Organization for Migration**.



China, Iran and Russia stage joint naval drills in the Gulf of Oman

Section: Places in news

Context:

- The navies of **China, Iran, and Russia** have initiated their **fifth joint military drills** in the **Gulf of Oman** amid escalating regional tensions, including **Israel's conflict with Gaza** and **Houthi rebel attacks on Red Sea shipping**.

"Maritime Security Belt – 2024":

- These exercises are aimed at **protecting maritime economic activities**, with a focus on **regional maritime security, combatting piracy, and maritime terrorism**.
- Participating vessels include **Russia's Varyag cruiser and Marshal Shaposhnikov frigate**, and **China's guided-missile destroyer Urumqi, guided-missile frigate Linyi, and comprehensive supply ship Dongpinghu**.
- **Azerbaijan, India, Kazakhstan, Oman, Pakistan and South Africa** are observer countries.
- Concurrently, a **US-led naval coalition** is addressing **Houthi assaults in the Red Sea**, while **NATO** conducts extensive drills in **Northern Europe**, showcasing its defence capabilities, particularly against Russia.

Places in the news:

1. **Gulf of Oman:** The **Gulf of Oman** or **Sea of Oman**, also known as **Gulf of Makran** or **Sea of Makran**, is a **gulf** that **connects** the **Arabian Sea** with the **Strait of Hormuz**, which then runs to the **Persian Gulf**. It borders **Iran and Pakistan** on the **north, Oman** on the **south**, and the **United Arab Emirates** on the **west**.
2. **Red Sea:** The Red Sea is a **sea inlet** of the **Indian Ocean**, lying between **Africa** and **Asia**. Its connection to the ocean is in the **south**, through the **Bab-el-Mandeb Strait** and the **Gulf of Aden**. To its **north** lie the **Sinai Peninsula, the Gulf of Aqaba, and the Gulf of Suez** (leading to the Suez Canal). It is underlain by the **Red Sea Rift**, which is part of the **Great Rift Valley**.
 - Countries sharing a border with the Red Sea are **Saudi Arabia, Sudan, Egypt, Eritrea, Yemen, and**

Warring tribes in Papua New Guinea sign ceasefire deal

Section: Places in news

Context:

- A temporary ceasefire was negotiated in **Papua New Guinea** to address ongoing revenge killings in the country's remote highlands.

Background:

- The **central Enga province** has experienced years of tit-for-tat fighting, with a significant escalation in recent months.
- The ceasefire involves **two main factions**, the **Yopo Alliance** and the **Palinau Alliance**, which met in the capital, **Port Moresby**, to finalize a three-month ceasefire agreement.
- The agreement mandates both factions to lay down arms and halt all forms of hostility.

Historical Context:

- Clashes between highland clans in **Papua New Guinea** have a centuries-old history. However, the recent violence has been exacerbated by the introduction of mercenaries and automatic weapons, intensifying the cycle of violence.

Papua New Guinea:

- **Papua New Guinea** is a country in **Oceania** that comprises the **eastern half of the island of New Guinea** and its offshore islands in **Melanesia** (a region of the southwestern Pacific Ocean north of Australia).
- Officially the **Independent State of Papua New Guinea**, it shares its **only land border** with **Indonesia** to the **west** and it is directly adjacent to **Australia** to the **south** and the **Solomon Islands** to the **east**.

- Its capital, located along its southeastern coast, is **Port Moresby**.
- The country is the **world's third largest island country**, with an area of 462,840 km² (178,700 sq mi).
- **Enga Province:**
 - **Enga** is one of the provinces in **Papua New Guinea (PNG)**.
 - **Enga** is geographically situated in the **northern region of Papua New Guinea** and was separated from the adjacent Western Highlands at the time of national independence in **1975**.
 - The majority ethnic group are **Engans**.

What is the Darien Gap? And why are more migrants risking this Latin American route to get to the US?

Section: Places in news

Darien Gap:

- The **Darien Gap** is a **dangerous, dense jungle** stretching across **northern Colombia** and **southern Panama**.
- Lacking paved roads, it spans approximately **60 miles (97 kilometres)** and is characterized by difficult terrain including mountains, rivers, and swamps.
- It has become a **significant route for global human migration**, requiring migrants to traverse challenging conditions for four to ten days.



Increased Crossings and Dangers:

- Originally, around **10,000 people annually** navigated this route, but numbers surged to **133,000 in 2021** and **over half a million in 2023**.
- **Controlled by criminal organizations**, the journey is perilous, involving **extortion, kidnapping, and even mass sexual assaults**.
- The journey's physical challenges are immense, with reports of **deaths, injuries, and diseases common among migrants**.

Causes of Migration Surge:

- Factors driving this surge include **violence, insecurity, and instability in migrants' home countries**.
- **Legal immigration options** being **limited**, particularly for individuals from **low-income countries**, has pushed many towards **irregular migration paths** like the Darien Gap.
- Policy changes, such as **Mexico's visa requirement for Venezuelans in 2021**, have **redirected migrants towards this perilous route**.

Demographics:

- In **2023, Venezuelans** comprised over half of the migrants, with significant numbers also from **Haiti, China, Afghanistan, Nepal, Cameroon, and Angola**.
- The migration demographic is diverse, with **over half being adult men, 26% adult women, and 20% children**, including **infants and toddlers**.

Government and Humanitarian Responses:

- Visa restrictions and governmental ambivalence towards humanitarian aid have exacerbated the dangers.

- The **Panamanian government's decision to prohibit Doctors Without Borders from providing medical support in the Darien Gap in 2024** is expected to **increase the risks for migrants**.
- The **Los Angeles Declaration on Migration and Protection**, announced in **May 2022**, aims to **improve regional coordination** and **introduce legal programs for resettlement, humanitarian parole, and family reunification**.
- However, these programs are **limited by nationality** and **often require official documents**, excluding many migrants traversing the **Darien Gap**.

Burkina Faso, Mali & Niger hint at a new west African currency: what it'll take for it to succeed

Section: Places in news

Context:

- On 11 February 2024, **General Abdourahmane Tiani**, leader of **Niger's military junta**, proposed a **new common currency** for **Niger, Burkina Faso, and Mali** during a national TV address.



Details:

- This initiative is a step towards **emancipation from colonial legacies**, specifically from the **CFA franc**, a currency rooted in **French colonization**.
- These **three nations, all former French colonies** recently **overtaken by military regimes**, have also **established the Alliance of Sahel States (AES)** for defense purposes.
- Following military coups, the **Economic Community of West African States (Ecowas)** has sanctioned them, leading to their withdrawal from **Ecowas**, though they remain part of the **West African Economic and Monetary Union (Uemoa)** that uses the **CFA franc**.
- This currency is backed by the **Banque de France** under specific agreements with the **BCEAO**.

For a multilateral currency to function effectively, several conditions are essential:

- **Coordination of Macroeconomic and Budgetary Policies:** There must be a strict alignment of economic and budgetary policies among the participating countries. This alignment ensures **currency stability and prevents trade imbalances**, fostering **confidence in the economy and supporting regional growth**.
- **Establishment of Strong Monetary Management Institutions:** It's crucial to have **robust institutions**, such as a **common central bank**, with **sufficient authority to conduct an independent and stable monetary policy**. This ensures the currency's value is preserved and helps manage economic fluctuations.
- **Creation of an Integrated Common Market:** The **free movement of goods, services, capital, and labor** is **fundamental to stimulate economic growth** and enhance regional cooperation. Existing frameworks like the **West African Economic and Monetary Union** are beneficial in this context.
- **Implementation of Crisis Monitoring and Resolution Mechanisms:** There should be systems in place to deal with **economic shocks**, including **common reserve funds** and **currency swap arrangements**. Currency swaps allow for the exchange of currency amounts between two parties under agreed terms, helping to manage exchange rate risks and support cross-border financing.

Are these conditions met in Burkina Faso, Niger and Mali?

- It's difficult to say whether these conditions have been fully met in the three countries. It would mean having a firm understanding of whether these, among other, conditions have been met:
 - harmonisation of government policies
 - macroeconomic stability through inflation control
 - limit on public debt
 - maintenance of a balanced current account.

Potential Gains:

- A larger monetary zone could lead to **improved trade integration** and **more efficient allocation of resources**.
- The countries might gain more flexibility in dealings with external partners, fostering independence.
- The monetary union could **reduce transaction costs** and **make the region more attractive to investors** due to **increased trade integration and independence**.

Risks:

- The creation of a new currency might be **perceived as a threat** by the **West African Economic and Monetary Union** and **Ecowas**, potentially leading to **regional tensions** and the **fragmentation of existing economic blocs**.
- The departure of these countries could diminish the **economic and political influence** of **West African Economic and Monetary Union** and **Ecowas**.
- There's a risk that the **new currency could depreciate against the CFA franc**, negatively affecting exporters to other union countries.
- Without strong formal frameworks for controlling and managing the new currency, speculation and uncertainty about its value could arise, highlighting the need for robust institutions for its management and supervision.

The flaring conflict in eastern Congo

Section: Places in news

Context:

- Recent escalations in conflict in the **eastern Democratic Republic of Congo (DRC)** have **intensified the humanitarian crisis** there, with numerous fatalities and hundreds of thousands displaced due to clashes between the **Congolese army** and the **Rwandan-supported M23 group** near **Goma** in **North Kivu province**.

Details:

- The situation has escalated further with the seizure of **Nyanzale** by rebels, resulting in significant casualties and displacement. Accusations of **Rwanda's** support for the rebels have heightened tensions between **Congo** and **Rwanda**, increasing the risk of broader conflict and threatening food security for millions.
- This surge in violence coincides with the **UN** beginning to withdraw its peacekeepers from **South Kivu province** and comes after floods that left over two million people needing humanitarian assistance.

What is the conflict?

- The **conflict** in the **eastern Democratic Republic of the Congo (DRC)** traces back to the **1990s civil wars** and the **1994 Rwandan genocide**, where **extremist Hutus** killed around **800,000 ethnic Tutsis** and **moderate Hutus**.
- Post-genocide, approximately **two million people** fled to the **DRC**, forming militias that reignited conflicts.
- These tensions led to the **First Congo War**, with **Rwanda** and **Uganda** supporting the **Alliance of Democratic Forces for the Liberation of Congo (AFDL)** to overthrow **Zaire's** government, renaming the country the **DRC**.
- The **Second Congo War** followed in **1998** due to **fears of Rwandan annexation**, involving **multiple foreign armies** and resulting in **immense casualties** and a humanitarian crisis.
- Despite **numerous peace agreements**, ongoing conflicts involving various groups have caused nearly **six million deaths** and **displaced millions in the region**, marking it as **one of the world's deadliest conflicts since World War II**.

Who are the M23 rebels, and what do they want?

- The **M23 rebels**, also known as the **March 23 Movement**, are **one of over a hundred insurgent groups** active in **eastern Congo**, primarily fighting to defend **Tutsi** interests against **Hutu militias**.
- Originating in **2012**, M23 is named after a **2009 ceasefire deal** where the **Tutsi-led National Congress for the Defence of the People (CNDP)** was to integrate into the **Congolese army**, a promise M23 accuses the government of failing to keep.
- This led them to **seize Goma** and other towns in **2012**, though they were briefly pacified by a **2013 peace deal**.
- Reactivating in **2022**, M23 resumed attacks in **North Kivu province**, citing aggression from the **Hutu-led Democratic Forces for the Liberation of Rwanda (DFLR)**, allegedly in collusion with the **Congolese army**.
- Their recent offensives, aimed at **Goma** and causing **mass displacement**, have intensified the **region's humanitarian crisis** and spurred protests demanding an end to **Rwandan support** for the rebels.

Tensions between Rwanda and Congo:

- The violence in **eastern Congo** has heightened tensions between the **DRC** and **Rwanda**, with the **former accusing Rwanda of supporting the M23 rebels through funds, troops, and arms**, a claim backed by a **United Nations report** but denied by **Rwanda**.

- **Rwanda** attributes the escalation to **Congo's repatriation of regional peacekeepers** and **defends its military activities** near the border as measures for national security.
- International pressure on **Rwanda** has **increased**, notably from **the U.S.**, which **condemned Rwanda's support for M23** and called for the withdrawal of its defense forces and missile systems from the **DRC**.
- **France** also urged **Rwanda** to cease its support for the rebels.
- This surge in conflict risks **regional destabilization and augments the humanitarian crisis**, with **NGOs** reporting **artillery strikes on civilian areas** and the consequent retreat of health and aid workers.
- The situation's severity is compounded by global attention being diverted to other international crises, raising concerns that the escalating humanitarian disaster in Congo might be overlooked.

Places in news:

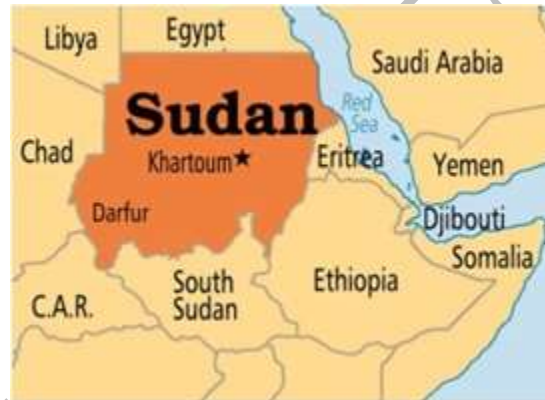
- **Town of Sake** and **Goma**- in North Kivu province of **Democratic Republic of Congo (DRC)**.
- **Nyanzale**- A town and a camp for Internally Displaced People (IDPs) in the **Rutshuru territory** of **North Kivu province, Democratic Republic of the Congo**.

Over 50 million people may be food insecure in eastern Africa, warns WFP

Section: Places in news

Context:

- The **World Food Programme (WFP)** has issued a warning about the **rapid rise in food insecurity** across **eastern Africa**, affecting potentially **54 million people**.



Details:

- **Sudan** (17.7 million), **Ethiopia** (15.8 million), and **South Sudan** (5.7 million) are the most affected countries.
- The causes of this crisis include **conflict, climatic shocks** such as **drought** and **flooding due to erratic rainfall, inflation, disease outbreaks, lack of access to nutritious diets and safe water**, and the **impacts of climate change** leading to **violence among smallholder farmers**.
- **Key factors for food insecurity:**
 - In **Sudan**, ongoing fighting between the **Sudan Armed Forces (SAF)** and the **Rapid Support Forces (RSF)** is exacerbating food needs.
 - **Ethiopia** faces vulnerability to **climate-induced shocks**, with recent **droughts affecting multiple regions**. Drought has returned to **Tigray, Afar, Amhara, and parts of Oromia, Southern, and Southwest regions**, causing severe suffering.
 - **South Sudan** is experiencing **acute food insecurity** worsened by the **arrival of returnees and refugees from Sudan and Ethiopia**.
 - The region is also dealing with a large number of **internally and internationally displaced people**, totalling approximately **23.4 million**, including **5 million refugees and asylum seekers** and **18.4 million internally displaced persons**.
- However, the **WFP** anticipates **food insecurity to remain stable** into the **second quarter of 2024**, thanks to **improved weather conditions** and **the effects of the lean season**.
- The **United Nations Food and Agriculture Organization** predicts positive effects on crop production due to **two consecutive wetter-than-normal seasons**, which should aid the region's recovery from the **2020-2023 drought**, increase market supply, and lower food prices.

- Despite these hopeful signs, the **northern part** of the **region** is expected to **face dry weather conditions, heat stress, and water and pasture deterioration** during the March-May period.
- This will impact livestock body condition, production, and market value, further influencing food security.
- The **WFP** recommends ongoing **monitoring of food insecurity** causes for timely early warning and action.

Maintaining maritime security in the Western Indian Ocean

Section: Places in news

Context:

- The EU's maritime security force against piracy, Operation Atalanta, confirmed Wednesday the hijacking of a Bangladeshi-flagged bulk carrier with 23 people on board while sailing in Somali waters.

More on news:

- **Since 1 January 2023**, the designation of the Indian Ocean High Risk Area (HRA) put in place by the shipping industry has been rescinded, due to the improved piracy situation in the region.
- IMO continues to support signatory States to implement the **Djibouti Code of Conduct (DCoC), as amended by the Jeddah Amendment**, to enhance maritime security in the Western Indian Ocean and the Gulf of Aden.
- **The European Union Naval Force Atalanta** is responsible for maintaining security in the Indian Ocean and has been a benchmark in the fight against piracy for the past 15 years.

About Operation Atalanta:

- **Operation Atalanta, formally European Union Naval Force (EU NAVFOR) Somalia**, is an ongoing counter-piracy military operation at sea off the Horn of Africa and in the Western Indian Ocean.
- It is the **first naval operation conducted by the European Union (EU), in support of United Nations resolutions 1814, 1816, 1838, and 1846 adopted in 2008** by the United Nations Security Council.
- Since 29 March 2019, the **operational headquarters is located at Naval Station Rota (NAVSTA Rota) in Spain**, having moved from London as a result of the British withdrawal from the EU.
- It is part of a larger global action by the EU to prevent and combat acts of **piracy in the Indian Ocean, and it is the first EU naval operation to be launched.**
- It maintains its activities to deter, prevent and repress piracy and armed robbery at sea and has extended its geographical scope north of the Red Sea.
- It cooperates with the **multinational Combined Task Force 151 of the US-led Combined Maritime Forces (CMF) and NATO's anti-piracy Operation Ocean Shield.**
- The mission was launched in December 2008 with a focus on protecting Somalia-bound vessels and shipments belonging to the WFP and AMISOM, as well as select other vulnerable shipments.
- In addition, Operation Atalanta monitors fishing activity on the regional seaboard.

Areas in news:

Gulf of Aden:

- The Gulf of Aden is a deepwater gulf of the **Indian Ocean between Yemen to the north, the Arabian Sea to the east, Djibouti to the west, and the Guardafui Channel, Socotra and Somalia to the south.**
- In the northwest, it connects with the **Red Sea through the Bab-el-Mandeb strait, and it connects with the Arabian Sea to the east.**
- To the west, it narrows into the **Gulf of Tadjoura in Djibouti.**
- **The Aden Ridge lies along the middle of the Gulf and is causing it to widen about 15mm per year.**



Red Sea:

- **The Red Sea (Erythraean Sea) is a seawater inlet of the Indian Ocean, lying between Africa and Asia.**
- The connection to the ocean is in the south through the **Bab el Mandeb strait and the Gulf of Aden.**
- To the north lie the **Sinai Peninsula, the Gulf of Aqaba, and the Gulf of Suez (leading to the Suez Canal).**
- The sea is underlain by the **Red Sea Rift which is part of the Great Rift Valley.**
- The six countries bordering the Red Sea are: **Saudi Arabia, Yemen , Egypt , Sudan , Eritrea , Djibouti**
- Islands include the **Dahlak Archipelago, the Farasan Islands, and Zubair Archipelago.**
- Key ports of the Red Sea are **Jeddah (Saudi Arabia), Port Sudan (Sudan), Djibouti Port (Djibouti), Aqaba Port (Jordan).**
- **Bab el Mandeb Strait:** Located at the southern entrance of the Red Sea, connecting it to the Gulf of Aden and the Indian Ocean.
- **Strait of Tiran:** Situated at the northern end of the Red Sea, separating the Sinai Peninsula from the Saudi Arabian coastline and providing access to the Gulf of Aqaba.

On the mass kidnappings in Nigeria

Section: Places in news

Context:

- **Nigeria is grappling with its most severe economic crisis** in recent years, compounded by a **surge in kidnappings**, especially in its **northern region.**

What is the latest crisis?

- The latest crisis in Nigeria involves a **series of mass abductions** attributed to suspected **Boko Haram** militants and other armed groups, primarily targeting the northeastern and northwestern regions:
 - **Borno's Ngala Local Government Area** (kidnapping of at least 200 internally displaced persons),
 - **Kaduna State** (287 students were kidnapped from a government school in **Chikun**) and
 - **Sokoto State** (15 children were abducted)
- This series of kidnappings follows a history of similar attacks, notably the **2014 abduction of 276 girls from Chibok by Boko Haram.**



What's fueling the surge in kidnappings in Nigeria?

- It is attributed to **economic, security, and political challenges.**
- **Key factors** include a **struggling economy, high unemployment, surging inflation, food insecurity, and instability in the Niger Delta.**
- Kidnappings have become a lucrative industry, with ransom payments as the primary motive. **Nigeria** faces security crises across all regions, with threats from **Boko Haram, bandit groups, criminal gangs, sea piracy, and armed separatists.**

How has the government responded?

- In response to the surge in kidnappings, **Nigerian security forces** are endeavoring to **secure the victims' safe release.**
- **President Bola Tinubu** has firmly **opposed the payment of ransoms** for the nearly 600 people recently abducted, aligning with **Nigerian law that penalizes anyone paying a ransom with up to 15 years in prison**—a measure **enacted in 2022 to combat the rampant kidnapping crises.**

Who are the Majeed Brigade, the Baloch militants who carried out the Gwadar attack?

Section: Places in news

Context:

- The Majeed Brigade of the separatist group Baloch Liberation Army (BLA) has claimed responsibility for Wednesday's attack on a complex outside Pakistan's strategic Gwadar Port.

More on news:

- Pakistan has said **eight militants and two security personnel** were killed in the attack; the BLA has, however, claimed to have killed 25 security personnel.
- The BLA is the most prominent of the **many separatist groups in Pakistan's restive Balochistan province**.
- The **Majeed Brigade, which has been active since 2011, is the BLA's dedicated suicide squad**.
- The unit is named after two brothers, both of whom were called Majeed Langove.
- The Majeed Brigade has also attacked the **Chinese Consulate in Karachi (2018), the Gwadar Pearl Continental Hotel (2019), and the Pakistan Stock Exchange in Karachi (2020)**, according to the South Asia Terrorism Portal.

The Balochistan context:

- **Balochistan, in Pakistan's southwest, is the country's largest and most sparsely populated province.**
- It has **oil reserves and abundant natural resources, but the ethnic Baloch are Pakistan's poorest and most under-represented people.**
- In recent years, **Baloch militants have repeatedly targeted both Gwadar and Chinese nationals in the country.**

About Majeed Brigade:

- The BLA is the most prominent of the many separatist groups in Pakistan's restive Balochistan province.
- The Majeed Brigade, which has been active since 2011, is the BLA's dedicated suicide squad.
- The unit is named after two brothers, both of whom were called Majeed Langove.

About Balochistan:

- Balochistan is a historical region in **Western and South Asia, located in the Iranian plateau's far southeast and bordering the Indian Plate and the Arabian Sea coastline.**
- This **arid region of desert and mountains is primarily populated by ethnic Baloch people.**
- The Balochistan region is split among three countries: **Iran, Afghanistan and Pakistan.**
- Administratively it comprises the **Pakistani province of Balochistan, the Iranian province of Sistan and Baluchestan, and the southern areas of Afghanistan, which include Nimruz, Helmand and Kandahar provinces.**
- Balochistan is the largest among the **4 provinces in Pakistan.**
- It is located in the **southwestern part of Pakistan.**
- It is bordered by **Iran (west), Afghanistan (northwest), by Khyber Pakhtunkhwa and Punjab provinces (northeast and east), by Sindh province (southeast) and by the Arabian Sea (south).**
- Its southern coastline, including the **Makran Coast, is washed by the Arabian Sea, in particular by its western part, the Gulf of Oman.**

At least 69 Rohingya refugees rescued after boat capsizes off Indonesia

Section: Places in news

Context:

- A wooden boat carrying an estimated **150 Rohingya refugees** capsized off **Aceh's coast in Indonesia**. 69 individuals have been rescued, but many are feared drowned.

Details:

- The rescued persons brought to port by the **Commission for Missing Persons and Victims of Violence (KontraS Aceh)**.
- **Background:**
 - The **Rohingya**, fleeing persecution in **Myanmar** and living in overcrowded camps in **Bangladesh**, often attempt to reach **Malaysia**.
- **Indonesia is not a signatory to the 1951 UN Convention on Refugees.**

UN Refugee Convention, 1951:

- The **1951 Convention** Relating to the **Status of Refugees** was the **first comprehensive attempt to define refugees and charted a detailed guideline for host countries** to ensure the adequate protection and preservation of the rights of all refugees.
- It **puts out clearly who a refugee is and what kind of assistance, rights and legal protection** a refugee is entitled to receive.
- It also lays down the **obligations of refugees** towards the host countries.
- The Convention also **specifies certain categories of people**, such as war criminals,

who do not qualify for refugee status.

- **India is not a signatory** to these conventions due to following reasons:
 - Dispute over definition of refugees
 - National security
 - Cultural strain
 - Loss of sovereignty

Definition of Refugee:

- **The 1951 convention defines a refugee as:**
 - A person who is outside his or her country of nationality or habitual residence
 - Has a well-founded fear of being persecuted because of his or her race, religion, nationality, membership of a particular social group or political opinion
 - Unable or unwilling to avail him— or herself of the protection of that country, or
 - Unable to return there, for fear of persecution

Various Rights conferred to Refugees

- The right not to be expelled, except under certain, strictly defined conditions.
- The right not to be punished for illegal entry into the territory of a contracting State.
- The rights to work, housing, education, public relief and assistance, freedom of religion, access courts, and freedom of movement within the territory.
- The right to be issued identity and travel documents.
- The right to be protected from refoulement apply to all refugees.

Places in news:

- Kuala Bubon and Aceh province- Indonesia

HC strikes down UP madrasa law, says put students in regular schools

Section: Places in news

Context:

- The **Allahabad High Court** declared the **Uttar Pradesh Board of Madarsa Education Act, 2004, unconstitutional for violating 'secular' principles and 'fundamental rights under Article 14'** of the Constitution.
- The court instructed the **Uttar Pradesh government to integrate madrasa students into regular schools** recognized by the state's education boards, ensuring adequate seat availability and establishment of new schools as needed.
- The government shall also ensure that **children between the ages of 6 to 14 years are not left without admission in duly recognised institutions.**

Background:

- **Uttar Pradesh** hosts **16,513 recognized** and **8,449 unrecognized madrasas**, catering to nearly **25 lakh students**. The **madrasa Act** is also **"violative of Section 22 of the University Grants Commission Act, 1956"**.

Legal Challenges:

- Petitioner Anshuman Singh Rathore argued that the Act violates constitutional rights to equality, non-discrimination, and education.
- It was also contended that the Act contradicts the **Right to Education (RTE) Act** by **excluding madrasas from compulsory education norms.**

Government and Madrasa Board's Defense:

- The state and the Madrasa Board defended the educational role of madrasas, emphasizing their **affordability for marginalized communities** and arguing that the **UGC Act does not apply to religious education.**

Court's Response to Objections:

- The court dismissed objections regarding the petitioner's standing, recognizing the issue's significance concerning the **fundamental rights of children from financially weak minority families.**

Madrasa Board's Statement:

- **UP Madrasa Board chairman Iftikhar Ahmed Javed** noted the intent behind the Act was to **promote oriental languages** and stated that **government grants were not solely for religious education.**

Court's Observations:

- The court highlighted the **Act's emphasis on Islamic studies for progression** and the **optional nature of modern subjects**, deeming it a **violation of the right to universal, quality, and secular education.**

Putin says gunmen who raided Moscow concert hall tried to escape to Ukraine. Kyiv denies involvement

Section: Places in news

Context:

- A violent attack occurred at **Crocus City Hall**, a **suburban Moscow music venue**, resulting in a devastating fire and over 130 deaths. The incident has led to a complex web of accusations, denials, and geopolitical implications.

Details of the Event:

- The assault on the **Crocus City Hall** in **Krasnogorsk** by gunmen caused more than 130 fatalities and injured over 100 individuals.
- The **Islamic State group's Afghanistan affiliate (ISIS-K)** claimed responsibility for the attack.
- Despite **ISIS-K's claim**, President Putin did not attribute the attack to them in his national address, instead suggesting a **connection to Ukraine—a claim strongly denied by Kyiv.**
- The **U.S.** confirmed **ISIS-K's responsibility**, emphasizing there was **no Ukrainian involvement.**
- **Geopolitical and Social Implications:**
 - The attack has sparked a range of reactions, from calls for **crackdowns** on **Tajik migrants** to criticism of **Russian security services** for not preventing the attack despite **prior warnings from the U.S.**
 - The incident has **intensified** the discourse around **Russia's internal security** and its **relations with Ukraine, Central Asian nations**, and the **international community regarding terrorism.**
- **International Reaction and Solidarity:**
 - The event highlights the ongoing global struggle against terrorism and its implications for international relations and domestic policies in Russia and beyond.

About ISIS-K:

- **Islamic State – Khorasan Province (ISIS-K or IS-KP)** is a branch of the **Islamic State** active in **South-Central Asia**, primarily **Afghanistan**, aiming to establish a **Caliphate governed by Islamic sharia law.**
- It seeks to **destabilize and overthrow governments** in the **historic Khorasan region** to create and expand a **Caliphate into South and Central Asia.**
- **Origins and Recruitment:**
 - Formed by **Afghan and Pakistani militants** from **al-Qaeda-aligned groups** returning from the **Syrian civil war**, recruiting dissatisfied **Taliban fighters and dissenters.**
 - **Conflict with Taliban:** Engaged in a **protracted conflict with the Taliban government in Afghanistan**, aiming to **discredit, destabilize, and overthrow the Taliban** to establish its own rule.
- **Taliban's Response:** Conducts violent raids against **ISIS-K**, protects foreign diplomats from attacks, and downplays **ISIS-K's** presence to attract foreign recognition and investment.

Operation Sankalp

Section: Places in news

Why in news: Operation Sankalp in the Gulf of Aden completed 100 days, which involve deployment of 5000 person, 21 ships and 900 hour of maritime surveillance aircraft

- It also involve 40 hour of operation by destroyer INS Kolkata to secure Vessel Ruen and forced surrender of 35 pirates and freed 17 crews

- This operation was carried out at a distance of 2600 km away from Indian coast by IAF C-17 aircraft dropped Marine commando and combat boat

Why Indian Navy vigil now:

- Rising Incident of attack on merchant vessels passing through international shipping lanes in **red sea, Gulf of Aden** and central and northern Arabian sea

Eg: Piracy Incident on MV Ruen (700 nautical miles from Indian coast)

- India being a largest Naval power of Indian Ocean region (IOR) so its responsibility of Indian Navy to ensure safe, secure and stable Indian Ocean region for free, open, inclusive and rule-based order is maintained
- Recent Attack led to the ships following cape of Good Hope routes (40 -50% company reroutes their shipping through Cape of Good hope
- The cost insurance rates will go up, With **Declaration of Red sea as high risk area insurance** rates goes up by (35-40)% and cost of container have gone up by \$500 to \$ 2000
- Shifting Maritime Incident closer to Indian EEZ(Exclusive economic zones 200 nautical miles) so effective surveillance of EEZ is essential to secure coast

Drone attack on MV Chem Pluto (220 Nautical miles from Porbandar)

- Indian ocean act as important of sea lanes of communication for flow of oils 40 % of total oil transported through through Arabian sea
- Help in Promoting India as first responder in case of **Emergency Under Security and growth for all in the region (SAGAR)** initiative and **Humanitarian Assistance and Disaster Reliefs (HADR)**

Deployment by Indian Navy: P 8I long range patrol Aircraft for surveillance, INS Mormugao, INS Kochi and INS Kolkata

Chad junta's main opponents barred from presidential vote

Section: Places in news

Context:

- Authorities in Chad said on March 24 they had barred 10 candidates, **including two fierce opponents of the military regime, from standing in the presidential election on May 6.**

More on news:

- The constitutional court said the candidates' applications — **namely those of outspoken opponents Nassour Ibrahim NeguyKoursami and Rakhis Ahmat Saleh** — had been rejected because they included “irregularities”.

Change of stance

- The new President promised to hand power back to a civilian government within 18 months and told the African Union he would not stand for **election as President.**
- But he then extended the transition period by two more years and on **March 2 officially announced he would run for the top office.**
- The **constitutional council also announced** it was opening a preliminary investigation for alleged forgery and use of forged documents against Mr. Koursami over suspicions with papers in support of his candidacy.

Areas in news:

Chad:

- Chad, officially the Republic of Chad, is an independent state at the crossroads of North and Central Africa.
- The landlocked country is bordered by **Libya to the north, Sudan to the east, the Central African Republic to the south, Cameroon to the southwest, Nigeria to the southwest (at Lake Chad), and Niger to the west.**
- Chad has several regions: **the Sahara desert in the north, an arid zone in the center known as the Sahel and a more fertile Sudanian Savanna zone in the south.**
- **Lake Chad, after which the country is named, is the second-largest wetland in Africa.**
- **Chad's official languages are Arabic and French.**
- It is home to over 200 different ethnic and linguistic groups.
- **Islam (55.1%) and Christianity (41.1%)** are the main religions practiced in Chad.



Ukraine says it hit two Russian warships in strikes on Crimea

Section: Places in news

Context:

- The defense forces of Ukraine successfully hit the **Azov and Yamal** large landing ships, a communications center and also several infrastructure facilities of the **Russian Black Sea Fleet**.

More on news:

- Moscow-installed officials in the region reported a major Ukrainian air attack and said air defenses had shot down more than 10 missiles over the Crimean port of Sevastopol.

Areas in news:

About Black Sea

- Black Sea is an inland sea located between far-southeastern Europe and the far-western edges of the continent of Asia and the country of Turkey.
- Bordering Countries: **Romania, Bulgaria, Ukraine, Russia, Georgia, and Turkey.**
- It connects to the **Mediterranean Sea first through the Bosphorus Strait, then through the Sea of Marmara and the Dardanelles Strait**, then south through the Aegean Sea and the Sea of Crete.
- The **Black Sea is also connected to the Sea of Azov by the Strait of Kerch.**



About Crimean peninsula

- The Crimean peninsula is connected on the northwest to the mainland by the “**Perekop Isthmus**”, a 5-mile- (8-km-) wide strip of land that has been the site of numerous battles for the **control of Crimea**.
- Between **Crimea and the mainland to the north lies Svyash (“Putrid Sea”)**, a network of shallow inlets that is separated from the **Sea of Azov by the Arabat Spit, a 70-mile- (113-km-) long sandbar along the eastern shore of Crimea.**
- The Crimean Peninsula was annexed by the **Russian Federation in 2014 and since then has been administered as two Russian federal subjects** – the Republic of Crimea and the federal city of **Sevastopol**.



About Sea of Azov:

- The Sea of Azov is an inland shelf sea in Eastern Europe connected to the Black Sea by the narrow Strait of Kerch, and is sometimes regarded as a northern extension of the Black Sea.
- The sea is bounded by Russia on the east, and by Ukraine on the northwest and southwest, currently under Russian occupation.

El Nino impact leaves Malawi and region on the edge of a hunger crisis

Section: Places in news

Context:

- Malawi has declared a **state of disaster** due to **severe drought conditions** affecting 23 of its 28 districts. The country's President has announced an **urgent need for over \$200 million in humanitarian assistance** to address the crisis.

Regional Impact:

- This announcement follows a similar appeal from **Zambia**, and **Zimbabwe** is also considering **declaring a drought disaster**.
- These developments come amid warnings from the **U.N. World Food Programme (WFP)** about a **potential hunger crisis in southern Africa**, driven by the **El Niño weather phenomenon** and **one of the driest spells in decades**.
- Nearly 50 million people in southern and parts of **central Africa** are **facing food insecurity**, exacerbated by **significant rainfall deficits** in countries like **Malawi, Mozambique**, and parts of **Angola**.
- Both **Malawi** and **Zambia** are currently experiencing **major cholera outbreaks**, underscoring the health challenges compounded by the drought crisis.
- The **Horn of Africa (Ethiopia, Eritria, Djibouti and Somalia)** is currently facing the **worst drought in 40 years** after **five seasons of poor rainfall**.

El Niño and Climate Change:

- **El Niño**, a natural weather pattern **causing below-average rainfall in southern Africa**, is believed to be **intensified by climate change**, resulting in more extreme impacts. The **2015-2016 El Niño** led to the **region's worst drought in 35 years**.

Region of Africa facing severe droughts:



Why does the weakness of low durability dog newer vaccines?

Section: Places in news

Context:

- The **measles vaccine** is **highly effective**, often providing **lifelong protection against the disease**, which is **not common among most vaccines**.

Details:

- A review of **34 licensed vaccines** revealed that **only five offer protection for over 20 years**, and **just three, including the measles vaccine, provide lifelong immunity**.
- **Fifteen** of these vaccines offer **5-20 years of protection**, while the remaining ones have a much **shorter efficacy**, typically around **five years or less**.
- Notably, the **majority of new-generation vaccines** tend to have a **shorter duration of protection**.

Different immune response:

- The **process of developing immunity** after **vaccination** is intricate and involves the **generation of memory B cells** by our **lymph nodes**, which remember the **antigens** introduced by **vaccines** and produce **potent antibodies** when encountering these antigens again.
- These **memory B cells** require **T cell support** to be produced, and **not all vaccines stimulate this necessary response**.
- Some vaccines, such as those for **typhoid** and **pneumococcal diseases**, do **not** prompt the body to create **B cells**, leading to the need for **frequent boosters to maintain immunity**.
- The **presence of memory B cells** alone does not guarantee immunity; for some vaccines, like those for **measles and rubella**, the level of these cells remains consistent over decades, correlating with **long-term antibody levels**.
- However, this is **not true for all vaccines**, indicating that another mechanism, involving **long-lasting plasma cells (LLPCs)** that reside in the **bone marrow** and can last for decades, plays a crucial role in sustained immunity.
- Achieving **long-term protection** involves generating both **memory B cells** and **LLPCs**, with differences in **vaccine efficacy** largely due to their varying abilities to produce these cells.

Explaining the disparity in durability:

- The **durability of vaccine-induced protection** is influenced by **three primary factors: vaccine-related, target pathogen-related, and host-related elements**.
- 1. **Vaccine-related factors:** **Live viral vaccines** (e.g., measles, rubella, yellow fever) and **virus-like particle (VLP) platforms** (e.g., HPV vaccines) generally offer **longer-lasting protection** compared to **killed pathogen** or **subunit vaccines**. The timing between doses, such as a **six-month interval** for **hepatitis B vaccines**, and the **use of adjuvants**, like **TLR agonists**, are crucial for a robust and lasting immune response.
- 2. **Target pathogen-related factors:** The characteristics of the **pathogen**, including its **incubation period** and **genetic stability**, significantly impact **immunity duration**. For instance, **viruses with shorter incubation periods** (like influenza and SARS-CoV-2) offer **limited time for an effective immune response**, leading to **shorter immunity periods**. Conversely, **pathogens with longer incubation times** or those causing more **prolonged infections** tend to result in more **durable immunity**. The **genetic stability** of the virus also plays a role; **RNA viruses with high mutation rates**, such as **influenza** and **SARS-CoV-2**, require frequent vaccine updates.
- 3. **Host-related factors:** The **age** and **gender** of the **individual**, along with other **physiological factors** like **obesity**, can influence the **persistence of vaccine-induced antibodies**. Even the time of day the vaccine is administered affects **immune response**, with **morning vaccinations** proving more effective due to the **circadian clock's impact on immune functions**.
- **Advances in bioengineering** are **introducing new strategies to enhance vaccine durability**, such as **nanoparticle** and **VLP technologies**, **controlled antigen delivery**, and **targeted adjuvant activation**. These innovations **aim to develop vaccines** that provide **long-lasting protection** with **fewer doses** by better understanding and leveraging the mechanisms of immune response durability.

For the IS, Russia is an enemy that destroyed its plans in Syria

Section: Places in news

Context:

- In recent years, the IS has released several propaganda videos, saying **Russians had ‘the blood of Muslims on their hands’ in Afghanistan, Chechnya, and Syria**.

More on news:

- The group uses these videos to **radicalize and recruit youth in Central Asian countries.**
- In the 1990s and early 2000s, **Russia witnessed a series of terror attacks, mostly by Chechen militants.**
- In recent years the IS-K has emerged as the most powerful branch of the IS networks.

Russia's role:

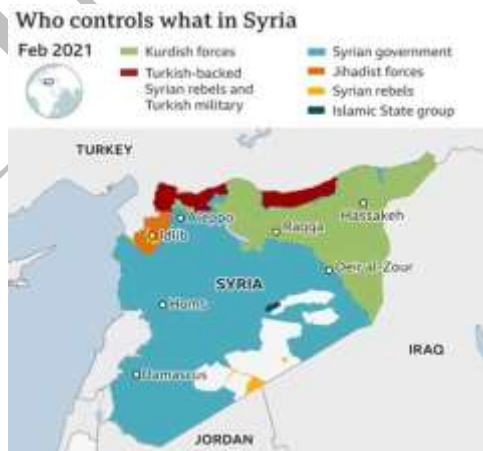
- One of the early promises of Vladimir Putin, who rose to power in the late 1990s, was that he would crush the terrorists and restore order.
- For many Russians, the Crocus City Hall shooting of March 22 in the outskirts of Moscow, in which at least 137 people were killed, brought back memories of the period of terror.
- But today, it's facing a new jihadist threat — the Islamic State, which has claimed responsibility for the Concert Hall attack.

Syrian intervention:

- The IS sees Russia as a key enemy because the Russian intervention in Syria in 2015 was one of the pivotal factors that turned the Syrian civil war in favor of the regime of President Bashar al-Assad.
- In 2017, when the IS seized the **Syrian city of Palmyra, Russia's Wagner, along with Syrian troops, liberated the city.**
- The IS was founded in the midst of the Syrian civil war in 2014, and one of the early cities it captured was **Raqa in eastern Syria.**
- It wanted to topple President Assad and capture Damascus, the seat of power of the Umayyad Caliphate.
- Today, Russia also supports regimes in **West Africa such as Mali**, which are fighting different jihadist groups.

About Syria:

- Syria is a country in **West Asia located in the Eastern Mediterranean and the Levant.**
- It is bounded by the **Mediterranean Sea to the west, Turkey to the north, Iraq to the east and southeast, Jordan to the south, and Israel and Lebanon to the southwest.**
- **Cyprus** lies to the west across the **Mediterranean Sea.**
- It is a unitary republic that consists of **14 governorates (subdivisions).**
- A country of fertile plains, high mountains, and deserts, Syria is home to diverse ethnic and religious groups, including the majority **Arabs, Kurds, Turks, Assyrians, Circassians, Armenians, Albanians, Greeks, and Chechens.**
- Religious groups include **Muslims, Christians, Alawites, Druze, and Yazidis.**
- The capital and largest city is Damascus, followed by **Aleppo, Homs, Latakia, Hama, Deir ez-Zor, and Raqa.**
- Arabs are the largest ethnic group, and Sunni Muslims are the largest religious group.
- Syria is now the only country that is governed by Baathists, who advocate Arab socialism and Arab nationalism.



U.K. issues online ads to deter illegal Channel crossings

Section: Places in news

Context:

- The U.K. on Monday launched a new global social media campaign, aimed at Vietnam in particular, to deter migrants from trying to cross the Channel from northern France on small boats.

More on news:

- It comes as statistics showed the number of arrivals using the hazardous and highly contentious route up by 15% so far this year compared to the same period in 2023.
- An increasing proportion of “small boat” arrivals hail from Vietnam, with the southeast Asian nation among the top 10 nationalities for migrants crossing the Channel, according to the U.K. Interior Ministry.
- Prime Minister Rishi Sunak has made “**stopping the boats**” one of his top priorities, and claimed to be succeeding when they fell by around a third last year.

About Online Adverts:

- The **new online adverts**, which feature real testimonies from those who have previously made the dangerous journeys are being posted on Facebook and YouTube to target Vietnamese migrants.
- They also warn prospective migrants of “the reality” of living in Britain “with no right to be in
- the U.K. and no access to public services or funding”.
- It follows a similar campaign last year targeting migrants from Albania, which contributed to a
- 90% reduction in arrivals from the Balkan country.

About English Channel:

- The **English Channel is an arm of the Atlantic Ocean that separates Southern England from northern France and links to the southern part of the North Sea by the Strait of Dover at its northeastern end. It is the busiest shipping area in the world.**
- The Channel was a key factor in Britain becoming a naval superpower and has been utilized by Britain as a natural defense mechanism through which they halted many would-be invasions, such as the Napoleonic Wars and those of Adolf Hitler in World War II.
- The population around the **English Channel is predominantly located on the English coast and the major languages spoken in this region are French and English.**



Global Resources Outlook 2024

Section: Reports and Indices

Context: Global Resources Outlook 2024, released on final day of assembly, reveals shocking statistics

What is Global Resources Outlook?

- It is a flagship report of International Resource Panel

What is International Resource Panel (IRP)?

- The International Resource Panel (IRP) was launched by the United Nations Environment Programme (UNEP) in 2007 to build and share the knowledge needed to improve our use of resources worldwide. The International Resource Panel is a scientific panel of experts that aims to help nations use natural resources sustainably without compromising economic growth and human needs. It provides independent scientific assessments and expert advice on a variety of areas, including:
- The volume of selected raw material reserves and how efficiently these resources are being used the lifecycle-long environmental impacts of products and services created and consumed around the globe options to meet human and economic needs with fewer or cleaner resources.

- The Secretariat of the IRP is hosted by the **United Nations Environment Programme (UN Environment)** through its office in **Paris, France**.

India 'one of the worst autocratisers': V-Dem report on democracy

Section: Reports

Democracy Report 2024:

- The **Sweden (Gothenburg)-based V-Dem Institute** released the '**Democracy Report 2024**'.
- The **Democracy Report 2024** is based on contributions from **4,200 scholars worldwide** and utilizes **31 million datasets** covering **202 countries** from **1789 to 2023**.
- This summary underscores the concerning trend of **democratic backsliding in India and globally**, highlighting the critical role of upcoming elections and governance in shaping the future of democracy.

Key findings:

- The V-Dem Institute categorizes nations into four types: **Liberal Democracy, Electoral Democracy, Electoral Autocracy, and Closed Autocracy**.
- As of **2023, 71%** of the world's population (5.7 billion people) live under **autocratic regimes**, a significant increase from **48% a decade ago**.
- **Democratisation** is occurring in **only 18 countries**, affecting **5%** of the global population.
- The report notes **deterioration in almost all democratic components**, with **freedom of expression, clean elections, and freedom of association/civil society** being the most affected.
- **Electoral management bodies' autonomy** is **weakening in more than half of the autocratising countries**.
- The report highlights a **global trend towards autocratisation**, with **42 countries** (35% of the global population) moving towards **less democratic governance**. **India** represents about **half of this demographic**, making it a significant contributor to the trend.

Specific Observations on India:

- **India** has been downgraded from an "**electoral autocracy**" since **2018** to "**one of the worst autocracies**".
- **India's** level of "**liberal democracy**" has **regressed** to levels last seen in **1975**, during **Indira Gandhi's emergency declaration**.
- The current government, led by the **BJP**, has been critiqued for **undermining freedom of expression, media independence, and civil liberties**.
- Laws related to **sedition, defamation, and counterterrorism** have been used to suppress dissent.
- There's a noted suppression of **religious freedom, intimidation of political opponents, and silencing of dissent in academia**.
- **Bhutan** is highlighted as the **only liberal democracy** in **South and Central Asia**.
- The report specifically mentions that a **third term for the BJP and Mr Modi in India** could lead to further autocratisation.

Topic no. 26 – India's Rankings in Human Development and Gender Inequality

Section: Reports

Human Development Index (HDI):

- **2022 Ranking:** India ranked 134 out of 193 countries.
 - HDI Value: 0.644
- **2021 Ranking:** India ranked 135 out of 191 countries.
 - HDI Value: 0.633

Trend: India's HDI value increased to 0.644 in 2022, **showing an improvement compared to 2021**. This places **India in the medium human development category**.

Progress:

- **Life Expectancy:** Increased from 67.2 to 67.7 years.
- **Expected Years of Schooling:** Reached 12.6 years.
- **Mean Years of Schooling:** Increased to 6.57 years.
- **Gross National Income (GNI) per Capita:** Increased from \$6,542 to \$6,951.

Overall Change (1990-2022):

- HDI Value Increase: 48.4%
 - From 0.434 in 1990 to 0.644 in 2022.

Gender Inequality Index (GII):

- **2022 Ranking:** India ranked 108 out of 193 countries.
 - GII Score: 0.437
- **2021 Ranking:** India ranked 122 out of 191 countries.
 - GII Score: 0.490

Improvement: India showed significant progress in reducing gender inequality, **jumping 14 ranks in the GII-2022 compared to GII-2021.**

Gender Gaps:

- Labour Force Participation: **8% difference between women (28.3%) and men (76.1%).**

Key Points:

1. Human Development Progress:

- India has **demonstrated improvements** in all HDI indicators, **including life expectancy, education, and GNI per capita.**
- The country's GNI per capita has seen substantial growth, **increasing by approximately 287% since 1990.**
- Life expectancy, **expected years of schooling, and mean years of schooling have also shown positive trends.**

2. Gender Inequality Reduction:

- **India's GII value of 0.437 is better than** the global and South Asian averages.
- The country has made strides in **reducing gender inequality**, as reflected in its improved GII ranking.
- However, there remains a significant gender gap in the labour force participation rate.

3. Medium Human Development Category:

- With an HDI value of 0.644, **India remains in the medium human development**
- The country's progress in various HDI indicators reflects a positive trend in overall development.

4. Global and Regional Context:

- The report emphasizes that **while some countries have seen record human development, half of the poorest nations remain below their pre-crisis levels of progress.**
- India's progress, **especially in reducing gender inequality**, is notable compared to global and South Asian averages.

India's rankings in the HDI and GII highlight both progress and areas for further improvement in human development and gender equality.

Human Development Report (HDR)

The **Human Development Report (HDR)** is an annual publication released by the **United Nations Development Programme (UNDP)** since 1990.

The HDI is a composite index that measures the average achievements in human development across countries. It considers four key indicators:

1. **Life Expectancy at Birth:** This indicator reflects the **average number of years a newborn is expected to live**, providing insights into the overall health and well-being of a population.
2. **Expected Years of Schooling:** This indicator estimates the **number of years of education a child entering school is expected to receive**, providing insights into educational opportunities.
3. **Mean Years of Schooling:** This indicator measures the average number of years of education received by **adults aged 25 years and older**, offering insights into the overall educational attainment of a population.
4. **Gross National Income (GNI) per Capita:** This indicator reflects the average income of a country's citizens, **adjusted for purchasing power parity (PPP)**. It provides insights into the economic well-being and standard of living.

By combining these indicators into a single index, **the HDI offers a comprehensive snapshot of a country's overall level of human development. Countries are ranked based on their HDI scores, allowing for comparisons and assessments of progress over time.**

Theme in 2021-2022: "Uncertain Times, Unsettled Lives: Shaping our Future in a World in Transformation" - The Human Development Report 2021-22 focuses on the theme of uncertainty and change in a rapidly evolving world. It **explores the impacts of global trends such as technological advancements, climate change, demographic shifts, and the COVID-19 pandemic** on human development.

Theme in 2023 - UNDP Report "Breaking the Gridlock": The data was published in the **United Nations Development Programme's** report titled **"Breaking the Gridlock: Reimagining Cooperation in a Polarized World"**. This report builds on the 2021–2022 Human Development Report findings, **highlighting global trends and challenges in human development.**

About Gender Inequality Index (GII)

The Gender Inequality Index (GII) is a composite measure **developed by the United Nations Development Programme (UNDP) to assess gender disparities in various aspects of life within countries.** It provides a comprehensive overview of **gender gaps in health, empowerment, and economic opportunities.** The **GII aims to highlight areas where women face relative disadvantages compared to men and where progress is needed to achieve gender equality.**

Components of the Gender Inequality Index:

1. **Reproductive Health:** This dimension measures **maternal mortality rates and adolescent birth rates.** High maternal mortality rates and early adolescent pregnancies are indicators of limited access to reproductive health services and education.
2. **Empowerment:** The empowerment dimension includes two indicators:
 - **Proportion of parliamentary seats held by women:** This reflects the representation of women in national parliaments, indicating their political participation and influence.
 - **Proportion of women aged 25 years and older with at least some secondary education:** Education plays a crucial role in empowering women and expanding their opportunities.
3. **Labor Market Participation:** This dimension considers the **labor force participation rate for women aged 15 and older compared to men.** A significant gap in labor force participation indicates disparities in economic opportunities and access to employment.

Interpretation of the Gender Inequality Index:

The **GII is expressed as a value between 0 and 1, with higher values indicating greater gender inequality within a country.**

- A **GII value close to 0 indicates lower gender inequality,** where women and men have more equal opportunities and outcomes.
- A **GII value closer to 1 indicates higher gender inequality,** where women face greater disparities compared to men in various aspects of life.

Households across the world waste 1 billion meals a day, says UN report

Section: Int reports

Food Waste Index Report 2024:

- Jointly authored by the **United Nations Environment Programme (UNEP)** and **WRAP (Waste and Resources Action Programme), a U.K.-based non-profit.**
- **International Day of Zero Waste- 30 March.**

Key findings:

- Households across the globe **wasted over one billion meals a day in 2022,** even as **783 million people** struggled with **hunger** and a **third of humanity** faced **food insecurity.**
- Out of the **total food waste in 2022, 60%** happened at the **household level,** with **food services** responsible for **28%,** and **retail 12%.**
- **Sustainable Development Goal 12.3- Halving food waste by 2030.**
- Food wastage is **not a "rich country problem"** with observed average levels of household food waste for high-income, upper-middle, and lower-middle-income countries differing by just **7 kg per capita.**
- At present, **only four G-20 countries (Australia, Japan, the U.K., U.S.)** and the **European Union** have food waste estimates suitable for tracking progress to 2030.
- **Hotter countries** appear to **generate more food waste per capita in households,** potentially due to higher consumption of fresh foods with substantial inedible parts and a lack of robust cold chains.
- **Greenhouse Gas (GHG) emissions** due to **food loss and waste generated** are **five times higher** than that of the **aviation sector.**
- Compared to **urban areas, rural ones** generally **wasted less food.**
-

Polity

Mask names of those acquitted in criminal cases from digital records, HC tells media

Section: Constitution

Context:

- The **Karnataka High Court**, through **Justice M. Nagaprasanna**, advised the media to proactively remove or anonymize the **names of individuals acquitted in criminal cases from their digital archives to avoid forcing these individuals to seek legal remedies for name removal.**

Details:

- This suggestion was made alongside a **directive to the High Court's registry to anonymize the personal details of a 27-year-old** who was exonerated in a **criminal case**, emphasizing the **individual's right to dignity.**
- The court highlighted that **once a person is acquitted, discharged, or has their criminal proceedings quashed**, allowing their association with the crime to persist online contradicts the **essence of life protected under Article 21 of the Indian Constitution.**
- The court's stance **aims** to facilitate a form of **digital forgetting**, aligning with human tendencies to forget, invoking the **right to privacy principles** established in the **K.S. Puttaswamy case** by the apex court.

'Right of Erasure':

- The **Karnataka High Court** referenced the recently **notified Personal Data Protection Act**, effective from **August 11, 2023**, highlighting its **recognition of the "right of erasure" of personal data.**
- This move aligns with global legal trends towards the **rights to be forgotten, correction, and erasure of personal data.**
- The court cited a **2018 UK judgment (NT1 Vs Google LLC)** that underscored the **right of individuals**, even those acquitted or discharged by competent courts, to **live with dignity**, challenging **Google's resistance to delisting such individuals.**
- Additionally, the **High Court** referred to a **Supreme Court directive** to anonymize the names in a case regarding **sexual offenses** and a **2023 Delhi High Court order directing media platforms to remove the name of an accused whose criminal case was quashed following a settlement.**
- These references demonstrate a **growing legal consensus on the importance of protecting individuals' dignity and privacy post-acquittal.**

K S Puttaswamy case and Right to Privacy:

- In **August 2017**, a **nine-judge bench** of the **Supreme Court** in **Justice K. S. Puttaswamy (Retd) Vs Union of India** **unanimously held that Indians have a constitutionally protected fundamental right to privacy that is an intrinsic part of life and liberty under Article 21.**
- It held that **privacy is a natural right** that inheres in all natural persons and that the **right may be restricted only by state action that passes each of the three tests:**
 - First, such state action must have a legislative mandate;
 - Second, it must be pursuing a legitimate state purpose; and
 - Third, it must be proportionate i.e., such state action — both in its nature and extent, must be necessary in a democratic society and the action ought to be the least intrusive of the available alternatives to accomplish the ends.

A living will, so the terminally ill can avoid the indignities of prolonged hospital care

Section : Constitution

Recent event:

- A gathering of **30 people**, mostly doctors, nurses, and volunteers of the **Pain and Palliative Care Society**, signed **'living wills'** in **Thrissur, Kerala.**
- The **objective** of the **'group signing'** was to **create awareness and ease confusion about the living will.**

What is a "Living will"?

- A **'living will'** is a **legal document** prepared in advance, detailing your preferences for medical care or for the termination of medical support in circumstances in which you are no longer able to make those decisions for yourself.
- **Supreme Court verdict:**
 - The **Supreme Court** ruled on **March 9, 2018**, that in **specific conditions**, a person has the **right to decide against artificial life-support by writing a living will.** It upheld the **fundamental right to die peacefully and with dignity (Article 21).**
- In **January 2023**, the court modified the **guidelines** for its **2018 order** and made it simpler.

- **Broder perspective of signing a ‘Living will’:**
 - Signing a living will does not mean the patient should not receive treatment after signing the living will. Palliative surgery or chemotherapy can be employed to reduce pain.

Modified guidelines:

- One must be of legal age and sound mind to make a living will.
- The person must be aware of the conditions in which curative treatments and life support systems will be halted.
- The decision to prepare a living will must be taken without any compulsion.
- The signing of the will must be witnessed by two people and should be attested by a gazetted officer or a notary.
- A copy must be handed over to the doctor and an assigned person (a close relative or friend).
- Copies of the living will should also be sent to the secretary of the local self-government and the district magistrate.

India top’s Internet shut down

Section: constitution

For five straight years, India has topped the global list of countries imposing internet bans, with about 60% of all blackouts recorded in the world, between 2016 and 2022 having been in India.

What does the law say?

- Indian States and Union Territories can impose an internet shutdown only in case of a “public emergency” or in the interest of “public safety”, according to the Indian Telegraph Act. However, the law does not define what qualifies as an emergency or safety issue
- These rules – the **Temporary Suspension of Telecom Services (Public Emergency or Public Safety) rules** – stated that internet shutdowns can now only be ordered by the home secretary of the union or state governments.
- The rules also say that only in “unavoidable circumstances”, the passing of orders can be delegated to someone not lower than the rank of a joint secretary to the government of India. And even in this case, the official must be authorized by the centre or state home secretary.
- Shutdowns could be ordered where “necessary” or “unavoidable”, during a “public emergency” or in the “interest of public safety”.
- Regarding Internet shutdowns, **Supreme Court in the case of Anuradha Bhasin** explicitly recognised two things:
 - that the **freedom to access information** is a fundamental right under **Article 19(1)(a)** of the constitution;
 - and that the **freedom to conduct your trade, profession or business** over the internet is also a fundamental right under **Article 19(1)(g)**.
- These rights which are enshrined in the constitution, can only be curtailed in the interest of the “sovereignty and security of the state, integrity of the nation, friendly relations with foreign states, or public order or for preventing incitement to the commission of an offence.
- Additionally, most orders for shutdown apply to mobile internet, not broadband. Thus, these shutdowns disproportionately affect those from lower income groups.

Minimum age to cast postal ballots hiked to 85 years

Section: Elections

Context:

- The government on Friday, in consultation with the **Election Commission, amended the Conduct of Election Rules, 1961, to raise the minimum age for senior citizens eligible for voting by postal ballot, to 85 years from 80 years.**

Recent Changes:

- According to the electoral roll published on **February 8, of the 96.88 crore electors in the country, 1.85 crore were above the age of 80.**
- The rules enable postal ballot voting for a “**notified class of electors**”, which includes essential services workers, persons with disabilities, Covid-19-infected or suspected cases and senior citizens.
- **In Section 27(A) (e), senior citizens had been defined as those above 80 years.**
- **In the conduct of Elections Rules-1961, in rule 27A, in clause (e), for the words and figures—above 80 years, the words and figures —above 85 years shall be substituted.**

About Postal Ballot:

- A restricted set of voters can exercise postal voting.
- Through this facility, a voter can cast her vote remotely by recording her preference on the ballot paper and sending it back to the election officer before counting.
- Members of the armed forces like the Army, Navy and Air Force, members of the armed police force of a state (serving outside the state), government employees posted outside India and their spouses are entitled to vote only by post.
- In other words, they can't vote in person.
- Voters under preventive detention can also vote only by post.
- Special voters such as the President of India, Vice President, Governors, Union Cabinet ministers, Speaker of the House and government officers on poll duty have the option to vote by post. But they have to apply through a prescribed form to avail this facility.
- The Returning Officer is supposed to print ballot papers within 24 hours of the last date of nomination withdrawal and dispatch them within a day.
- This is done so that the ballot papers reach the concerned voter well before the polling date and she has enough time to send it back before the counting day.
- Postal ballot papers for members of the Armed Forces are sent through their record offices.
- For members of the armed police force of a state (serving outside the state), government employees posted outside India and their spouses, the ballot paper can be sent through post or electronically.
- For remaining categories ballot papers can be delivered personally or through post.
- The postal ballot facility had been extended to persons with disability, absentee voters who are working in essential services and senior citizens (above 80 years) for the first time in 2019, after an amendment to the Conduct of Elections Rules on the recommendation of the ECI.
- Those who opt for the facility are visited at home by poll officials, who facilitate the filling up of the postal ballots.
- The whole procedure is done after informing the political parties and under videography.
- During the Covid-19 pandemic, the facility was extended to those infected or suspected to be infected with the coronavirus, starting with the Bihar Assembly elections in 2020.
- However, the ECI eventually decided not to extend the facility to those above 65 years.
- On August 23, 2023, the Law Ministry again amended the rule to take the eligibility back to 80 years from 65 years.

Shiv Sena row | Supreme Court asks whether Maharashtra Speaker contradicted verdict

Section: Elections

Context:

- The Supreme Court of India questioned Maharashtra Speaker Rahul Narwekar's decision to recognize Chief Minister Eknath Shinde's faction as the "real" Shiv Sena, based on 'legislative majority.'

Details:

- Chief Justice of India D.Y. Chandrachud, leading a three-judge Bench, raised concerns that this criterion seemed to contradict a previous ruling by the Constitution Bench.
- The Bench had previously emphasized that the Speaker's decision on party disputes should not solely rely on the legislative majority but should also consider the structure of leadership outside the Legislative Assembly, indicating the support from the party's political wing, not just its legislative members.
 - A majority faction of the legislature party cannot be construed as a political party for the purposes of the Tenth Schedule.
- This query came up in the context of resolving disqualification petitions against Mr Shinde by the rival Uddhav Thackeray faction under the anti-defection law.

2018 constitution:

- In the ongoing legal tussle regarding the Shiv Sena party's leadership, Senior advocates Kapil Sibal, A.M. Singhvi, and Devadutt Kamat argued that Maharashtra Speaker Rahul Narwekar erred by not recognizing the 2018 Constitution of Shiv Sena, which named Mr Thackeray as president.

- They highlighted that this constitution had been acknowledged by both the **High Court** and the **Supreme Court** previously, but the **Speaker disregarded it because it wasn't filed with the Election Commission of India**, opting instead for a **1999 version of the constitution** that had not been previously contested.
- Opposing this, Mr Salve, representing the other side, alleged that the documents presented by the **Thackeray camp** were fabricated and mentioned an ongoing similar case in the **Bombay High Court**, arguing against simultaneous petitions in multiple courts over the same matter.
- Despite this, the **Supreme Court** has decided to continue hearing the case, scheduling further arguments for the week of April 8 and requesting the records of the disqualification proceedings from the Maharashtra Speaker's office.

What it will take to have simultaneous elections in India

Section: Elections

Context:

- **The High Level Committee on One Nation, One Election** headed by former **President Ram Nath Kovind** has recommended that elections to Lok Sabha and state Assemblies should be held at the same time.

More on news:

- The committee recommended that the **elections to local bodies (municipalities and panchayats) too should be "synchronized"** so that they are held within 100 days of the simultaneous state and national elections.
- To give effect to its **recommendation, the committee has suggested 15 amendments to the Constitution of India** in the form of both new provisions and changes to existing provisions to be carried out through **two Constitution Amendment Bills**.

About two Constitution Amendment Bills.:

- The **first Bill will deal with the transition to a simultaneous election system**, and the **procedure for fresh elections to Lok Sabha or a state Assembly** before the expiration of their stipulated five-year term.
- According to the **Kovind committee, this Bill can be passed by Parliament without the requirement for consultation** with state governments or ratification by state Assemblies.
- The **second Bill will deal with municipal and panchayat elections**, as well as the creation of a Single Electoral Roll by the **Election Commission of India (ECI)**, with details of every voter and the seat for which they are eligible to vote.
- The **Kovind committee has acknowledged that this Bill** deals with subjects on which states have the primary power to enact laws — and it would, therefore, require the **approval or ratification** of more than half of India's states before it can be enacted.

Transition to simultaneous polls; Parliament's power to make laws

- The first Bill recommended by the Kovind committee would begin by inserting a **new article— 82A —into the Constitution**. **Article 82A** will establish the process by which the country will move to a system of simultaneous elections for Lok Sabha and state Assemblies.
- **Article 82A(1)** will state that **"on the date of the first sitting of the House of the People after a general election"**
- **Article 82A(2)** will state that **"all the Legislative Assemblies constituted in any general election held after the appointed date shall come to an end on the expiry of the full term of the House of the People"**.
- The proposed **Article 82A(3)** requires the ECI to hold **"General elections to the House of the People and the Legislative Assemblies simultaneously"**.
- **Article 82A(4):** If the ECI believes that elections to any legislative assembly cannot be conducted simultaneously, **"it may make a recommendation to the President, to declare by an Order, that the election to that Legislative Assembly may be conducted at a later date"**.
- **Article 82A(5) states** "the full term of the Legislative Assembly shall end on the same date as the end of the full term of the House of the People constituted in the General Election".
- The proposed Bill also **recommends amending Article 327, which gives Parliament the power to make laws relating to elections to Lok Sabha, Rajya Sabha, and state legislatures**, including the preparation of electoral rolls and delimitation of constituencies.
- The Kovind committee has **recommended that the power of Parliament under Article 327 should be expanded to include "conduct of simultaneous elections" as well**.

When Lok Sabha or state Assembly is dissolved before 'full term' ends

- **Lok Sabha and state Assemblies are constituted for a period of five years after each election.**
- The committee has recommended that this **five-year period be referred to as "the full term"** by amending **Sub-clause 2 of Article 83 ("Duration of Houses of Parliament")** and **Sub-clause 1 of Article 172 ("Duration of the State Legislatures")**.

- If Lok Sabha or a state Assembly is dissolved before the expiry of the full term, **the remaining period will be referred to as the “unexpired term”**.
- The recommended **Articles 83(4) and 172(4) state that the Lok Sabha or state Assembly** that replaces the previous one will serve only for the remaining **“unexpired term”** before being dissolved again once simultaneous elections are conducted as scheduled.
- These amendments are also a part of the **first Constitution Amendment Bill** proposed by the Kovind committee, which it says will not require ratification by states.

Amendment of certain laws relating to legislative Assemblies in Union Territories:

- The report has also recommended the amendment of certain laws relating to legislative Assemblies in Union Territories such as **The Government of National Capital Territory of Delhi Act, 1991, The Government of Union Territories Act, 1963, and the Jammu and Kashmir Reorganisation Act, 2019.**

The amendment does not require States ratification:

- **The elections to the House of the People and the State Legislative Assemblies are held by the Election Commission of India under the Constitution of India, The Representation of People Act, 1950, The Representation of People Act, 1951, and the rules and orders made thereunder.**
- The amendments required for simultaneous elections to the House of the People and the State Legislative Assemblies do not fall under the purview of the **provisions to Article 368(2) and hence, do not warrant a ratification by the States.**

About Article 328:

- The Kovind panel has stated that states under **Article 328 of the Constitution** only have residual powers on conducting Assembly elections; the power is mainly entrusted to **Parliament through Article 327.**
- The article deals with **Power of Legislature of a State to make provision** with respect to elections to such Legislature

Simultaneous local body elections, preparation of single electoral roll

- The **second Constitution Amendment Bill recommended by the Kovind committee** contains amendments that would require ratification by the states.
- Under **Article 368(2), any constitutional amendment that deals with subjects in the State List (where states have the power to enact laws)** would have to be ratified by at least half of the state legislatures in the country before it can be passed.
- Amendments suggested in the **second Bill relate to municipal and panchayat elections, which fall under Entry 5 of the State List titled “Local government”** and would require ratification by the states.
- The committee has **suggested the inclusion of a new Article 324A in the Constitution.**
- This new article would empower Parliament to make laws to ensure that municipality and panchayat elections are held simultaneously with the **General Elections (to Lok Sabha and state Assemblies).**
- The **Kovind committee has also recommended that new sub-clauses should be added to Article 325 of the Constitution.**
- The new **Article 325(2) proposed by the committee will create a “Single Electoral Roll for every territorial constituency for election in the House of the People, Legislature of a State or to a Municipality or a Panchayat”.**
- This electoral roll “shall be made by the Election Commission in consultation with the State Election Commissions”

Amendment to the Constitution:

- **Article 368 of the Constitution** deals with the power and procedure to **amend the Constitution.**
- **While several provisions can be amended by a simple majority** like in passing any ordinary legislation, a **special majority of not less than two-thirds of the members** present and voting is required for other provisions.
- **For a third category of “entrenched provisions” that impact the federal structure of the Constitution** or the powers of the state Assemblies, an amendment requires to be ratified by legislatures of at least half of the states.
- **Article 368(2)(d) lists the representation of states in Parliament** as one of the issues that would require ratification.

Lok Sabha Election Dates 2024: Voting to kick off on April 19, will be held in 7 phases; results on June 4

Section: Election

Context:

- Setting the stage for a two-month-long electoral battle, **the Election Commission Saturday announced that the Lok Sabha elections** will be kicking off on April 19 and will be held in seven phases.

More on news:

- The term of the **17th Lok Sabha is set to end on June 16**, while the terms of the **Andhra Pradesh, Arunachal Pradesh, Odisha and Sikkim Assemblies** will end on June 11, June 2, June 24 and June 2, respectively.
- The general elections will be held in seven phases through the months of April and May.
- **Four states, Arunachal Pradesh, Andhra Pradesh, Odisha and Sikkim will also be holding simultaneous Assembly elections.**
- The results will be declared on **June 4**.
- **The Model Code of Conduct**, which bars the government in power from announcing any new policy decisions, comes into effect immediately after the announcement.

About Election Commission:

- The Election Commission of India is an **autonomous constitutional authority responsible for administering Union and State election processes in India.**
- The body administers elections to the **Lok Sabha, Rajya Sabha, and State Legislative Assemblies in India, and the offices of the President and Vice President in the country.**
- Part XV of the Indian constitution deals with elections, and establishes a commission for these matters.
- Article 324 to 329 of the constitution deals with powers, function, tenure, eligibility, etc of the commission and the member

Appointment of Election Commissioners:

- The CEC and ECs will be appointed by the President upon the recommendation of a Selection Committee.
- **Appointment of the Commission:** The Commission will be appointed by the President, upon the recommendation of the Selection Committee.
- **The Selection Committee will comprise the Prime Minister, Cabinet Minister, and Leader of Opposition in Lok Sabha (or leader of the single largest opposition party).**
- A Search Committee headed by the Cabinet Secretary will suggest five names to the Selection Committee.
- The Selection Committee may consider any person other than those suggested by the Search Committee.

Term and reappointment:

- **Members of the Election Commission will hold office for six years, or until they attain the age of 65 years, whichever is earlier.**
- Members of the Commission cannot be re-appointed.
- If an EC is appointed as a CEC, the overall period of the term may not be more than six years.

Salary and pension:

- The salary, allowances, and other conditions of service of the CEC and ECs will be equivalent to that of the Cabinet Secretary.
- They will have an option to draw pension and other retirement benefits from the service that they belonged to previously.

Removal:

- The CEC may be removed in the same manner and on the same grounds as a Supreme Court Judge.
- ECs may be removed only upon the recommendation of the CEC.

About Model Code of Conduct:

- The MCC is a **set of guidelines issued by the Election Commission (EC)** to regulate political parties and candidates prior to elections. Basically, the code spells out the do's and don'ts for elections.
- This is in keeping with **Article 324 of the Constitution, which mandates EC to conduct free and fair elections to the Parliament and State Legislatures.**
- **It is not statutory** but Political Parties, Candidates and Polling Agents are expected to observe the norms, on matters ranging from the content of election manifestos, speeches and processions, to general conduct etc.
- The code comes into force on the announcement of the poll schedule and remains operational till the process is concluded.
- Certain provisions of the MCC may be enforced through invoking corresponding provisions in other statutes such as the **Indian Penal Code, 1860, Code of Criminal Procedure, 1973, and Representation of the People Act, 1951.**

[Election Commission introduces vote-from-home for citizens aged 85 and above](#)

Section: Elections

Context:

- Senior citizens who are above 85 years and persons with disabilities can opt for postal ballots and cast their votes from homes.

More on news:

- There are 81,87,999 senior citizen electors above 85 years and 2,18,442 electors above 100 years in the country, as on March 10.

Votes from homes:

- The **Election Commission of India (ECI)** for the first time made available the facility of vote-from-home (VfH) through postal ballot for two different types of voters — persons aged 85 years and above, and persons with disabilities (PwD).
- **The facility can also be availed by persons with more than 40 percent disability.**
- Two polling officials, accompanied by a videographer and a security person, will visit the voter's home and enable them to vote in a postal ballot.
- Voters will be informed in advance about the date and approximate time of visit of election officials by an SMS to the mobile number mentioned in the application.

Two visits

- If the elector is not present at the given address during the first visit under VfH, the polling team will inform about the schedule of their second visit.
- If they are not present even on the second visit, a further visit will not be entertained.
- Moreover, those absent during VfH will completely lose the opportunity to vote (through both VfH and EVM).

Form 12D

- Form 12D is a letter informing the **Assistant Returning Officer that he or she is not in a position to go to the polling station to vote.**
- The voters in the two categories must file Form 12 D with the Election Commission within five days of the release of the poll notification.
- The Union Law Ministry amended the Conduct of Elections Rules-1961 to change the definition of senior citizens who are eligible to choose the postal ballot facility from those "above 80 years" to those "above 85 years".

Fresh tussle with Governor: Why Tamil Nadu has moved SC to have a minister reinstated

Context:

The Supreme Court on Monday agreed to hear a plea by Tamil Nadu seeking its intervention in reinstating K Ponnudurai, a senior leader of the ruling Dravida Munnetra Kazhagam (DMK), as a minister.

More on news:

TN Governor Ravi refused to reinstate K Ponnudurai, whose conviction was stayed by the Supreme Court in a disproportionate assets case earlier.

In December last year, Ponnudurai was disqualified after the Madras High Court convicted him in a disproportionate assets case.

The disqualification:

- The Madras High Court on December 19 last year overturned a trial court verdict acquitting Ponnudurai and his wife in a disproportionate assets case.
- The HC convicted the former minister and his wife and awarded them a three-year jail term, along with a fine of Rs 50 lakh.
- This decision by the High Court triggered Section 8(3) of The Representation of the People Act, 1951.

Section 8(3) of The Representation of the People Act, 1951:

- A person convicted of any offense and sentenced to imprisonment for not less than two years shall be disqualified from the date of such conviction and shall continue to be disqualified for a further period of six years after his release.

Stay of the conviction:

- On March 11, a Supreme Court Bench comprising Justices Abhay Oka and Ujjal Bhuyan, however, stayed the conviction and the sentence.
- The grant of stay by the SC essentially means that Ponnudurai's conviction is put in abeyance, or is suspended pending a final decision.

Larger tussle between Tamil Nadu govt and governor

- **Article 164 (1) of the Constitution** states that the **Chief Minister** shall be appointed by the Governor and **"the other Ministers shall be appointed by the Governor on the advice of the Chief Minister, and the Ministers shall hold office during the pleasure of the Governor"**.

Disqualification of MP/MLAs:

Legal provisions regarding the disqualification of MPs/MLAs

- Disqualification of a lawmaker is prescribed in three situations.
- First is through the Articles 102(1) and 191(1) for disqualification of a member of Parliament and a member of the Legislative Assembly respectively.
- The grounds here include holding an office of profit, being of unsound mind or insolvent or not having valid citizenship.
- The second prescription of disqualification is in the Tenth Schedule of the Constitution.
- This provides for the disqualification of the members on grounds of defection.
- The third prescription is under The Representation of The People Act (RPA), 1951.
- This law provides for disqualification for conviction in criminal cases.

Under Representation of The People Act, 1951

- There are several provisions that deal with **disqualification under the RPA.**
- **Section 8 of the RPA deals with disqualification for conviction of offenses.**
- **Section 8(1) of the act** includes specific offenses such as promoting enmity between two groups, bribery, and undue influence or personation at an election.
- **Section 8(2) lists offenses that deal with hoarding or profiteering, adulteration of food or drugs and for conviction and sentence of at least six months** for an offense under any provisions of the Dowry Prohibition Act.
- **Section 8(3) disqualifies a convicted person** who has been sentenced to imprisonment for not less than two years.
- He is **disqualified from the date of such conviction and shall continue to be disqualified for a further period of six years since his release.**
- **Section 9 deals with disqualification for dismissal for corruption** or disloyalty, and for entering into government contracts while being a lawmaker.
- **Section 10 deals with disqualification for failure** to lodge an account of election expenses.
- **Section 11 of the act deals with disqualification** for corrupt practices.

How House terms and poll schedules are decided

Section: Elections

Context:

- The **Election Commission of India (ECI)** announced a **schedule adjustment for the elections to the Lok Sabha and four state Assemblies**, moving the **vote counting in Sikkim and Arunachal Pradesh to June 2**, from the initially scheduled **June 4**.
- This change was made because the **terms of the Legislative Assemblies** in these states **expire on June 2, 2024**.

Original Schedule:

- Initially, **Assembly elections in Arunachal Pradesh and Sikkim** were set to begin with notifications on **March 20**, nominations till **March 27**, withdrawals by **March 30**, and voting on **April 19**.
- **Lok Sabha elections** were planned in **seven phases** from **April 19 to June 1**, with a **single-day election in 22 states and Union Territories**, including **Arunachal Pradesh and Sikkim**. The **counting was originally set for June 4 for all seats**.
- **Reason for Change:**
 - The ECI realized post-announcement that the **assemblies' terms ended on June 2**, necessitating the **completion of the election process before this date**.

Constitutional Terms for Assemblies and Lok Sabha:

- The **Constitution mandates that state Assemblies and Lok Sabha last five years from their first sitting**.
- **For Lok Sabha, Article 83(2) states:** "The House of the People, unless sooner dissolved, shall continue for **five years** from the date appointed for its first meeting and no longer and the expiration of the said period of five years shall operate as a dissolution of the House."

- **For Legislative Assemblies, Article 172(1) states:** "Every Legislative Assembly of every State, unless sooner dissolved, shall continue for **five years** from the date appointed for its first meeting and no longer and the expiration of the said period of five years shall operate as a dissolution of the Assembly."
 - The term of the Assembly "may, while a **Proclamation of Emergency** is in operation, be **extended by Parliament.** for a **period not exceeding one year at a time and not extending in any case beyond a period of six months after the Proclamation has ceased to operate**".

Application to Sikkim and Arunachal Pradesh:

- The current Assemblies of **Sikkim and Arunachal Pradesh** first met on **June 3, 2019, ending their term on June 2, 2024.**
- Officials aim to complete counting and announce results before midnight of June 2.

Election Schedule Considerations:

- The **ECI** considers various factors like **weather, festivals, exams, and logistical requirements for security and polling stations.**
- The **expiration date of the legislature's term is a primary consideration, known five years in advance.**

Previous Instances and Adjustments:

- The **ECI** has in the past drawn up schedules delinking the counting in a particular state from the counting in the rest of the country.
- There have been **adjustments to accommodate state-specific circumstances**, such as in **2004 for Andhra Pradesh** and in **2023 for Mizoram**, to respect **local practices and significant dates.**

On campaigning in the name of religion

Section: Elections

Context:

- Recently the **Bharatiya Janata Party (BJP)** lodged a complaint with the **Election Commission of India (ECI)** against **Rahul Gandhi** for hurting the sentiments of Hindus through his remark on 'shakti'.

What does the law say?

- **Section 123(3) of the Representation of the People Act, 1951 (RP Act)** provides that **appeals by a candidate, or any other person with the consent of a candidate, to vote or refrain from voting on the ground of his religion, race, caste, community or language is a corrupt electoral practice.**
- **Section 123(3A)** denounces any attempt by a candidate to promote feelings of enmity or hatred among citizens on these grounds during elections.
- The RP Act further provides that **anyone found guilty of corrupt electoral practice can be debarred from contesting elections for a maximum period of up to six years.**

What does the MCC provide?

- The Model Code of Conduct (MCC) for the **guidance of political parties and candidates is a set of norms which has evolved with the consensus of political parties.**
- They have consented to abide by the **principles embodied in the said code.**
- It binds **them to respect and observe it in its letter and spirit.**
- This code provides that **no party or candidate shall indulge in any activity which may aggravate existing differences or create mutual hatred or cause tension between different castes, religious or linguistic communities.**
- It also provides that there shall be **no appeal to caste or communal feelings for securing votes.**
- Mosques, churches, temples or other places of worship shall not be used as a forum for election propaganda.
- Though the **MCC does not have any statutory backing, it has come to acquire strength in the past three decades because of its strict enforcement by the ECI.**

What has been the history?

- It is pertinent to note that **before 1961, Section 123(3) of the RP Act provided that 'systemic' appeal by a candidate on the grounds of religion, race, caste or community would amount to a corrupt electoral practice.**
- However, in order to curb communal, fissiparous and separatist tendencies, the word 'systemic' was omitted through an amendment in 1961.
- This meant that even a stray appeal for success in the elections on the **ground of one's religion or narrow communal affiliation would be viewed with disfavor by the law.**

- The ECI has barred leaders from campaigning, for violation of the MCC, for a short period of two to three days.

What has the Supreme Court ruled?

- In **Abhiram Singh versus C. D. Commachen (2017)** a seven-judge Bench by a majority of 4:3 held that candidates shall not appeal for votes on the basis of not just his/her religion but also that of the voters.
- The majority view provided a ‘**purposive interpretation**’ to **Section 123(3)** rather than just a literal one thereby rendering any appeal in the name of religion of even the voters as a corrupt electoral practice.
- The elections to Parliament or State legislatures are a secular exercise; constitutional ethos forbids the mixing of religious considerations with the secular functions of the State.
- Religion should remain a matter of personal faith.

What is needed?

- Political parties and candidates are likely to raise legitimate concerns of citizens faced by them on the basis of traits having origin in religion, caste, community or language in a democratic election process.

As Kejriwal becomes first sitting CM to be held, a look at ex-CMs’ arrests: Soren to Jayalithaa to Lalu

Section: Executive

Context:

- With the **Enforcement Directorate (ED) arresting Delhi Chief Minister and Aam Aadmi Party (AAP) supremo Arvind Kejriwal** Thursday night in connection with the alleged liquor policy scam, Kejriwal became the first sitting CM to have got arrested by any agency.

More on news:

- The ED’s move came hours after the **Delhi High Court refused to grant Kejriwal** protection from the central agency’s coercive action.
- On January 31 this year, **Jharkhand Mukti Morcha (JMM)** executive president Hemant Soren was forced to step down as the Jharkhand CM just before he was arrested by the ED in a money laundering case linked to an alleged land scam.
- On July 25, 1997, **Bihar CM Lalu Prasad was served an arrest warrant in the fodder scam.**
- He stepped down from his post, made his wife Rabri Devi the CM, and went to jail for about four months before getting bail.

Judicial Pronouncements:

- Judgments in the Supreme Court and High Courts have previously concluded that constitutional morality, good governance, and constitutional trust are the basic norms for holding a public office.
- A recent judgment by the **Madras High Court in S. Ramachandran versus V. Senthil Balaji** referred to arguments made in court on whether a Minister must forfeit his right to occupy a public office that demands a high degree of morality if he is accused of a “financial scandal”.
- In the 2014 Constitution Bench judgment of the Supreme Court in **Manoj Narula versus Union of India**, which had held that the basic norm for holding a public office was constitutional morality, that is, to avoid acting in a manner contradictory to the rule of law.
- The second norm was good governance.

Rules to arrest CM:

- As far as the **CBI is concerned, according to the provisions of the Code of Criminal Procedure 1973 (CrPC)**, the law enforcement agency can arrest any person against whom an arrest warrant has been issued by the court.
- The officers have **no discretion in carrying out the arrest warrant issued by the**

courts.

- In the case of arresting a chief minister, **the CBI can arrest a person** who is accused, while adhering and in compliance with certain rules and procedural aspects.
- They can only be arrested if there is enough reason to **believe that the accused**

would abscond, will try to destroy evidence, or act in a way so as to avoid the legal process.

- The **Chief Minister or de facto head of state government is treated legally, under the capacity of a government official**, who can be arrested by the CBI on other grounds which are not relevant to their discharge of official duties since, duties carried

out as Chief Minister have been executed in accordance to the Constitution of India, laws, rules and regulations of the Union of India.

Immunities under Article 361:

- **Under Article 361 of the Constitution only the President and Governor** are granted immunity from arrest and proceedings before a court.
- **The Prime Minister and Chief Minister of a state are not granted any immunity.**

Sort out differences on financial issues, SC tells Kerala and Centre

Section: Federalism

Context:

- The Supreme Court Wednesday asked the Centre and Kerala government, which have been sparring over the state's borrowing limit, to hold further discussions to sort out their differences.

More on news:

- A two-judge bench **presided by Justice Surya Kant** stated that the fiscal management of the states is an issue with which the Union must be concerned because ultimately it has its own impact on the nation's economy.
- Justice Surya Kant said the Centre is free to impose every other condition that it may feel appropriate to give sanction to borrow an additional Rs 13,608 crore "except the condition to withdraw the suit ...".

Article in news:

- **Article 293 of the Constitution:** The executive power of a State extends to borrowing within the territory of India upon the security of the Consolidated Fund of the State.
- **Article 293(3) of the Constitution:** State cannot raise a loan without the consent of the Government of India if any part of a previous loan from the central government remains outstanding.
- **Article 131 of the Constitution:** The Supreme Court has exclusive and original jurisdiction in matters of law between states or between states and the Union.

Why the Supreme Court overturned its 2018 decision, which set a time limit on courts' stay orders

Section: Judiciary

Context:

The court held that an SC bench from 2018 did not have the power to set a six-month time limit for vacating stay order.

What is the Stay Order?

- A stay order is a temporary measure to halt or defer the use of a property or land until a verdict is reached.
- It serves as a protective action taken by the court or legal authorities in India to secure the rights of a citizen.
- This action may lead to the suspension of an entire case or the suspension of specific proceedings within an ongoing case.
- In certain instances, a judge may issue a stay order without formal prompting from the opposing party, emphasizing its importance in critical developments.

Nature of Stay Order:

- Stay orders can be classified into two types: '**stay of proceedings**' and '**stay of execution.**'
- A stay of proceedings is issued when **parallel proceedings may impact each other.**
- On the other hand, a stay of execution involves a complete halt to the enforcement of a judgment, typically in cases where innocence is asserted, leading to a pardon.
- Stay orders can be **conditional or absolute.**

When a stay order is granted?

- The procedure for obtaining a stay order from the High Court is the same as for any lower Court.
- Every Court has inherent authority to stay proceedings in any action where the plaintiff is in default or has disobeyed any lawful order of the Court.
- Any other Court may issue a precept to the High Court, which is then 'competent to execute such decree to attach any property belonging to the judgment-debtor and specified in the precept'.

What the 2018 bench ruled in the Asian Resurfacing case?

- In 2018, a three-judge bench comprising Justices Adarsh Goel, Navin Sinha and Rohinton Nariman were deciding a batch of cases involving the Prevention of Corruption Act.
- These batches of cases had one aspect in common, that the respective High Courts had granted a stay at some stage of trial.
- Stay orders are passed for a court to temporarily halt a judicial proceeding, to secure the rights of a citizen.
- Grant of stay invariably delays the trial, irrespective of which side benefits from it.
- To address the big problem plaguing the criminal justice system, of undue delays in trials, the SC held that interim orders of stay at the High Court and Civil Court level will be only valid for six months.
- At the end of this period, they will automatically be rescinded or “vacated”.

What was the impact of the 2018 ruling?

This ruling led to the various questions as follows:

- First, whether the SC, under Article 142 of the Constitution (which allows the Supreme Court to pass any order to secure “complete justice”) can order automatic vacation of all interim orders of the HC of staying proceedings of Civil and Criminal cases on the expiry of a certain period?
- Second, whether the SC, under Article 142 of the Constitution, can direct the HCs to decide pending cases in which interim orders of stay of proceedings have been granted on a day-to-day basis and within a fixed period?

On what grounds has the 2018 ruling been undone?

- The five-judge bench held that constitutional courts should refrain from laying down precise timelines for deciding cases, highlighting the discretion that should be afforded to lower courts which are more aware of “grassroots issues”.
- The SC also pointed out that courts often have different patterns when it comes to their pending caseload, and so the concerned court is best placed to decide which cases to prioritize.
- The court also held that the bench in Asian Resurfacing did not have the power to set a six-month time limit for vacating stay orders.
- The bench in Asian Resurfacing had invoked Article 142.
- The court held that automatically vacating a stay order after six months would in fact “defeat justice” by nullifying interim orders that had been lawfully passed without hearing the parties.
- The court said that the six-month time limit would amount to court-created legislation, which is impermissible.
- Only the legislature has the power to decide if a category of cases should be decided within a specific amount of time.

About Article 226(3):

- Justice Manoj Misra in his separate opinion drew attention to Article 226(3) of the Constitution, which already provides a two-week time limit for High Courts to consider an application for the vacation of an interim order.
- If the application is not disposed of within those two weeks, Article 226(3) provides that the interim order will be vacated.
- It is pointed out that this essentially provides a process for automatically vacating a stay order, so long as an application is filed in the first place.

Central Consumer Protection Authority (CCPA) Advisory on Endorsing Illegal Betting

Section: Legislation in news

Advisory to Celebrities and Social Media Influencers:

- CCPA has asked celebrities and **social media influencers to refrain from endorsing or promoting illegal betting and gambling activities.**
- Stringent action will be taken against those found promoting such activities.

Concern Over Betting Platforms' Use of Celebrities:

- The advisory notes that **betting platforms are employing celebrities and influencers to endorse and promote betting activities.**

Legal Implications for Promotion:

- Engaging in promoting or advertising online gambling and betting, being illegal in most states, makes one equally liable for participating in illegal activities.
- Celebrities and influencers are advised to refrain from endorsing and promoting illegal betting and gambling activities.

Past Advisories by Information & Broadcasting Ministry:

- The **Information & Broadcasting Ministry** has issued advisories in the past cautioning publishers and digital platforms against carrying ads promoting betting or gambling.

Prohibition of Betting and Gambling:

- Betting and gambling are prohibited under the **Public Gaming Act 1867** and are considered illegal in most regions of India.
- Advertisement or promotion of online betting platforms and apps promotes an activity predominantly banned.

Persistence of Online Betting Platforms:

- Despite legal prohibitions, **online betting platforms and apps continue to advertise betting and gambling, sometimes under the guise of gaming.**

Financial and Socio-economic Implications:

- Endorsements of such activities have significant financial and socio-economic implications, especially for the youth.

Guidelines for Prevention of Misleading Advertisements:

- The CCPA mentions the Guidelines for **Prevention of Misleading Advertisements and Endorsements for Misleading Advertisements, 2022.**
- These guidelines categorically prohibit advertisements of products or services prohibited under any prevailing law.

Stringent Measures for Violations:

- Any violation of the guidelines will **lead to stringent measures as per the Consumer Protection Act, 2019.**
- Measures will be initiated against **manufacturers, advertisers, publishers, intermediaries, social media platforms, endorsers, and other relevant stakeholders involved in promoting illegal betting and gambling.**

Central Consumer Protection Authority (CCPA):

Establishment:

- Established in 2020 based on the provisions of the **Consumer Protection Act, 2019.**
- Nodal Ministry: The **Ministry of Consumer Affairs.**

Composition:

- The CCPA is headed by a Chief Commissioner.
- **It consists of two other Commissioners as members:**
 - One Commissioner deals with matters relating to goods.
 - The other Commissioner handles cases related to services.
- Additionally, the CCPA has an Investigation Wing headed by a Director General.

Powers and Responsibilities:

- *Objective:* The primary objective is to **promote, protect, and enforce the rights of consumers as a class.**
- Empowered:
 - **Conduct Investigations:** Into violations of consumer rights and institute complaints/prosecutions.
 - **Order Recall:** Of unsafe goods and services from the market.
 - **Discontinue Unfair Practices:** Such as misleading advertisements and unfair trade practices.
 - **Impose Penalties:** On manufacturers, endorsers, publishers, or entities involved in misleading advertisements.

District Collectors' Powers:

- **District Collectors also have the power to investigate complaints of:**
 - Violations of consumer rights.
 - Unfair trade practices.
 - False or misleading advertisements.

Objective:

- The main objective of the CCPA is to **promote, protect, and enforce the rights of consumers as a class.**

Enforcement Actions:

- The CCPA is empowered to:
 - Conduct investigations into violations of consumer rights.
 - Institute complaints or prosecutions against offenders.

- Order the recall of unsafe goods and services.
- Discontinue unfair trade practices and misleading advertisements.
- Impose penalties on manufacturers, endorsers, publishers, or entities involved in misleading advertisements.

Consumer Protection Focus:

- The primary focus of the CCPA is on **ensuring consumer protection** and upholding their rights.
- It aims to create a fair and transparent marketplace for consumers.

Regulatory Body:

- The **CCPA acts as a regulatory body overseeing consumer protection laws and regulations.**
- It plays a vital role in enforcing consumer rights and ensuring compliance by businesses.
- By enforcing consumer rights, **ensuring market integrity, and fostering consumer awareness, the CCPA contributes significantly to a fair and transparent consumer environment in India.**

Two key RTI portals under 'emergency maintenance'

Section: Legislation in news

Context:

- The **Union government's RTI Online portal**, crucial for submitting **Right to Information applications**, has been **temporarily unavailable** due to **"emergency maintenance"** this week, complicating access to previously filed applications.

Details:

- Concurrently, the **Election Commission's separate RTI portal fixed a security flaw that risked exposing users' personal information.**
- The flaw's resolution involved coordination with the [Indian Computer Emergency Response Team \(CERT-in\)](#).
- Additionally, the portal experienced difficulties with its **payment gateway**, now resolved but with **limitations on payment methods** and the **notable absence of the State Bank of India for Net banking options.**

Error message:

- The **government's RTI Online portal**, managed by the **Department of Personnel and Training (DoPT)** under the **Ministry of Personnel, Public Grievances & Pensions**, has been experiencing functional disruptions.
- The **DoPT claimed the implementation of an archival mechanism to enhance the portal's speed.**
- The **Telangana RTI portal** also experienced downtime due to **"essential training"** for **government officers.**

About the RTI Act:

- The **RTI Act**, enacted in **2005**, empowers Indian citizens to access information from public authorities, fostering transparency, accountability, and participation in governance.
- It **superseded the Freedom of Information Act of 2002.**
- Initiatives like the one by **Mazdoor Kisan Shakti Sangathan (MKSS)** in **Rajasthan**, leading to the **state's Right to Information Act in 1997**, paved the way for the **national RTI Act.**
- **Section 22** ensures the Act's provisions prevail over contradictions with the **Official Secrets Act of 1923** or any other existing laws and agreements, except for those not covered by the Act.
- **Constitutional Backing:**
 - Derived from **Article 19(1)(a) of the Constitution**, which guarantees freedom of speech and expression.
 - Recognised as a **fundamental right under Article 19**, as per the Supreme Court ruling in the **Raj Narain vs. the State of Uttar Pradesh case.**
- **Time Frame for Providing Information:**
 - Public authorities must furnish the requested information **within 30 days** of receiving an application.
 - For information concerning the life or liberty of a person, it must be provided within **48 hours.**
 - An additional **five days** are added if the application is **routed through an Assistant Public Information Officer** or sent to an incorrect public authority.
- **Exemptions:**
 - **Section 8(1)** specifies exemptions, including information related to national security, state strategy, foreign relations, and incitement to offenses.

- **Implementation Mechanisms:**

- The **Public Information Office (PIO)** plays a key role in executing the **RTI Act**, acting as a liaison between the requesting citizen and the government entity holding the information.
- Applicants can appeal to the **First Appellate Authority** within the public authority if dissatisfied with the **PIO's response** or if their request is denied.
- A second appeal can be made to the **Central or State Information Commission** if issues remain unresolved after the first appeal.

Recent Amendments in the RTI Act

- **Section 44 (3) of the Digital Personal Data Protection Act 2023** amended **Section 8 (1)(j) of the RTI Act**.
 - This amendment exempts all personal information from disclosure, removing the previously established exceptions that allowed for the release of such information.
- **Right to Information (Amendment) Act, 2019:**
 - This amendment revised the tenure and service conditions for the **Chief Information Commissioner (CIC)** and **Information Commissioners (ICs)** at both **central and state levels**.
 - The tenure of **ICs** is now **determined by the central government**, set for a period of **3 years**, as opposed to the original fixed term of **5 years**.
 - The amendment specifies that the **salary, allowances, and other service conditions** of the **CIC and ICs** (both at the **centre and states**) will be **prescribed by the central government**.
 - The **2019 Act** eliminated provisions that **allowed for the deduction of pension or other retirement benefits** for previous government service at the time of appointing the **CIC and ICs**.

SC seeks T.N. govt.'s response to HC order on child porn

Section: Legislation in news

Context:

- The Supreme Court has sought a response from the Tamil Nadu government to a petition filed by Just Rights for Children Alliance, an NGO coalition, challenging a Madras High Court order that mere downloading and private viewing of child pornography was not an offense.

More on news:

- A Bench, headed by **Chief Justice of India D.Y. Chandrachud**, issued a notice to the State on the basis of a plea against the High Court quashing the FIR and criminal proceedings against a 28-year-old man.
- There was a glaring increase in child pornography cases in the country – **from 44 cases in 2018 to 1,171 cases in 2022** – as per **National Crime Records Bureau data**.

Madras High Court Verdict:

- The High Court had quashed the judicial proceedings against the man and held that downloading child pornography was not an offense under **Section 67B of the Information Technology (IT) Act, 2000**.
- The High Court had categorically said that watching child pornography per se was not an offense as the accused had merely downloaded it on his electronic gadget and watched it in private.

About Child Pornography:

- Under the **The Protection of Children from Sexual Offences (Amendment) Act, 2019** a person is guilty of using a child for pornographic purposes if he uses a child in any form of media for the purpose of sexual gratification.
- The **Act also penalises persons who use children for pornographic purposes** resulting in sexual assault. The Bill defines child pornography as any visual depiction of sexually explicit conduct involving a child including photograph, video, digital or computer generated image indistinguishable from an actual child.
- The **Act penalizes storage of pornographic material for commercial purposes with a punishment of up to three years, or a fine, or both**.
- The Bill amends this to provide that the punishment can be imprisonment between three to five years, or a fine, or both.
- In addition, the Bill adds two other offenses for storage of pornographic material involving children.
- These include:
 - **(i) failing to destroy, or delete, or report pornographic material involving a child**
 - **(ii) transmitting, displaying, distributing such material except for the purpose of reporting it.**

CAA: Issues in the legal challenge to the law

Section: Legislation in news

Context:

- More than four years after Parliament passed The Citizenship (Amendment) Act, 2019, the Ministry of Home Affairs on Monday notified the Rules to implement the law.

More on news:

- The CAA, which had led to widespread protests in the winter of 2019-20, is also under challenge before the Supreme Court.

Timeline of The citizenship law

- In December 2019 Parliament passed an amendment to **The Citizenship Act, 1955**, to include a provision for grant of citizenship to migrants belonging to the **Hindu, Sikh, Buddhist, Jain, Parsi, or Christian communities who entered India before December 31, 2014 from Pakistan, Afghanistan, or Bangladesh.**
- The amendment relaxed the eligibility criteria for certain classes of migrants (on religious lines) **from three neighboring Muslim-majority countries.**
- Certain categories of areas, including tribal areas in **Assam, Meghalaya, Mizoram, and Tripura, and areas protected by the 'Inner Line' system, were exempted from the purview of the CAA.**
- **The colonial concept of Inner Line separates the tribal-majority hills of the Northeast** from the plains areas.
- **To enter and stay in these areas, an Inner Line Permit (ILP) is needed.**
- The law was notified on January 10, 2020 amidst protests around the country, particularly in Assam, but could not be implemented in the absence of the Rules.
- On May 28, 2021, the central government issued an order under **Section 16 The Citizenship Act, 1955**, giving district collectors in 13 districts with high migrant populations the power to accept citizenship applications from groups identified in the 2019 amendment.
- The **39-page Rules notified in the e-gazette on Monday** prescribe the modalities and procedure for eligible individuals to apply for Indian citizenship.
- The Rules specify what documents and paperwork are required for putting forward and considering a claim of citizenship.

The legal challenge

- The amendment was challenged before the Supreme Court in 2020 by the Indian Union Muslim League (IUML).
- Since then, more than 200 petitions have been filed and tagged with the IUML's challenge.
- In October 2022, a Bench comprising then Chief Justice of India U U Lalit and Justices Ravindra Bhat and Hima Kohli passed an order stating that final hearings would begin in December 2022 after CJI Lalit's retirement.
- The challenge to the CAA rests on the ground that it violates Article 14 of the Constitution, which says that "the State shall not deny to any person equality before the law or the equal protection of the laws within the territory of India". The petitioners' argue that using religion as a qualifier or a filter violates the fundamental right to equality.

The CAA and Assam:

- Apart from the equality argument, part of the challenge to the **CAA also rests on the fate of Section 6A of The Citizenship Act, 1955.**
- In December 2023, a five-judge Constitution Bench led by Chief Justice of India D Y Chandrachud reserved its verdict on the validity of Section 6A, which was introduced in the Citizenship Act after the signing of the Assam Accord between the Centre and the leaders of the Assam movement in August 1985.
- **The Accord determines who is a foreigner in the state of Assam.**
- **Clause 5 of the Accord states that January 1, 1966 shall serve as the base cut-off date for the detection and deletion of "foreigners", but there are provisions for the regularization of those who arrived in the state after that date, and upto March 24, 1971.**
- **This was also the basis of the final NRC published in 2019.**
- **Section 6A of the Act allows foreign migrants who came to Assam after January 1, 1966 but before March 25, 1971, to seek Indian citizenship.**
- If the effective cut off date of March 24, 1971 is upheld by the SC as the cut-off date for entry into the state, the CAA could fall foul of the Assam Accord, since it creates a different timeline.

Anti-piracy Act has been a great enabler: Navy chief

Section: Legislation in news

Context:

- The new Maritime Anti Piracy Act, enacted in 2022, has been a “great enabler”, and is one of the reasons why we have been successful, Navy Chief Admiral R. Hari Kumar said on the new law as the Indian Navy completed 100 days of ‘Operation Sankalp’.

More on news:

- Since mid-December, as part of **Phase 2 of Operation Sankalp**, the Indian Navy saw the deployment of over **5,000 personnel at sea**, over 450 ship days (with over 21 ships deployed), and 900 hours of flying by the maritime surveillance aircraft to address threats in the maritime domain.
- The act has empowered us to **visit, board, search and seize**.
- Any suspicious vessel craft or fishing boat or dhow which we suspect, we board, inspect, and if we find piracy triggers like **skiffs, weapons, ammunition**, then we take action to ensure that they don't proceed with their mission.
- There are very few countries which have an Act like this.
- In the last 100 days, as part of **Operation Sankalp**, the Navy has carried out over 1,000 boardings.
- Talking of a salient feature of the Act, maritime expert Pooja Bhatt said the Maritime Anti Piracy Act empowers the Indian Navy and Coast Guard to board, seize and arrest pirates operating in the high seas, in the **Exclusive Economic Zone (EEZ)** and beyond, and Indian courts can prosecute the perpetrators with life imprisonment, fine, or both.
- The Act also considers the offense as extraditable, where India has signed such treaties with those countries.
- India has an agreement with **Somalia where Somalian pirates have been extradited since 2017**.
- **An Act to give effect to the United Nations Convention on the Law of the Sea (UNCLOS)** relating to repression of piracy on the high seas and for matters connected therewith or incidental thereto.
- **India ratified UNCLOS in 1995**.

About Anti-Maritime Piracy Bill:

Short title, commencement and application.

- This Act may be called the Maritime Anti-Piracy Act, 2022.
- It shall come into force on such date as the Central Government may, by notification in the Official Gazette, appoint.
- The provisions of this Act shall apply to the high seas.

Meaning of Piracy:

“piracy” means:

- (i) any illegal act of violence or detention or any act of depredation committed for private ends by any person or by the crew or any passenger of a private ship and directed on the high seas against another ship or any person or property on board such ship;
- (ii) any act of voluntary participation in the operation of a ship with knowledge of facts, making it a pirate ship;
- (iii) any act of inciting or of intentionally facilitating an act described in sub-clause (i).

Punishment for piracy:

- Whoever commits any act of piracy, shall be punished—
- (i) with imprisonment which may extend to imprisonment for life or with fine or with both; or
- (ii) with death or with imprisonment for life, if such person in committing the act of piracy causes death or an attempt thereof.

Jurisdiction of Designated Court:

- The Designated Court shall have jurisdiction to try an offense punishable under this Act where such offense is committed—
- (i) by a person who is apprehended by, or is in the custody of, the authorized personnel or the police, regardless of the nationality or citizenship of such person;
- (ii) by a person who is a citizen of India or a resident foreign national in India or any stateless person.

Murmu presents President's Standard and Colors to four IAF units

Section: Msc

Context:

- President **Droupadi Murmu on March 8** presented the President's Standard's to two fighter squadrons of IAF and President's Colors to two formations at Hindon Air Force station.

More on news:

- This is the **first time in the history** of the service that four units have been awarded the President's Standard and Colors together in a single ceremony.
- These include:
 - **No. 45 'Flying Daggers'**, the first Light Combat Aircraft (LCA) squadron of the IAF and **No. 221 Squadron 'Valiants'** which flew almost one-third of all offensive missions of the IAF during the 1999 Kargil conflict will be at **President's Standard**.
 - The **11 Base Repair Depot (BRD)** and **509 Signal Unit (SU)** will be awarded **President's Colors**.
- The award of the President's Standard and Colors is the highest honor that can be bestowed upon any military unit.

Presidential standard of India:

- The presidential standard of India was a flag flown by the president of India from 1950 to 1971.
- It succeeded the flag of the governor-general of India (used during the 1947–1950 period of the Dominion of India) on 26 January 1950, when India became a republic.
- It ceased being used on 15 August 1971, when the president began using the national flag of India.
- The standard was a rectangle divided quarterly into blue and red quadrants. Each quadrant was occupied by national symbols drawn in gold outline. The symbols were-
 - 1st quarter: The **Lion Capital of Ashoka**, which is the State Emblem of India, to represent unity;
 - 2nd quarter: A **lively Indian elephant** from a 5th-century painting of Ajanta Caves, Maharashtra to represent patience and strength;
 - 3rd quarter: A **weighing scale** from the 17th-century **Red Fort**, Delhi, to represent justice and economy;
 - 4th quarter: A vase of **Indian lotus from Sarnath**, Uttar Pradesh to represent prosperity.

President's Colour Award:

- The President's Colour Award is the **highest honor** that can be bestowed upon **any military unit of India**.
- It is also known as **Nishaan**, which is an emblem that is worn by all unit officers on the left-hand sleeve of their uniform.
- While the practice of carrying the Colour into battle has stopped, the tradition of receiving, holding and parading the Colour continues even today in the Armed forces.
- The President's Colors is very significant, if the unit loses their colors, it is a disgrace for that unit and, if the unit captured the enemy's colors then it is a great honor for that unit.

Advisory to airlines by FSSAI

Section: National Body

The Food Safety and Standards Authority of India (FSSAI) has issued an **advisory to airlines regarding the proper labeling and compliance with food safety regulations for food served on flights**.

Labeling Requirements:

- **Use by Date and Time:** Airlines must ensure that prepared food served on flights is **properly labeled with essential information, including the "use by date and time."**
- **Caterer's Name:** The packaging of in-flight meals should **prominently display the name of the caterer or manufacturer**.
- **FSSAI License Number:** Passengers should be made aware of the **FSSAI license numbers of both the caterer/manufacturer and the airline**.
- **Packaging Details:** Other essential details such as **the date and time of packaging must be provided on the packaging**, as per the FSS (Labelling and Display) Regulations, 2020.

Compliance with Food Safety Laws:

- **FSSAI Act and Regulations:** Flight kitchen operators and in-flight food-service providers **must comply with the Food Safety and Standards Act, 2006, and its rules and regulations**, including the FSS (Labelling and Display) Regulations, 2020.

- **Licensing Norms:** Airlines are directed to ensure compliance with licensing norms, **especially when selling pre-packaged food products and private-label products.**
- **Grievance Redressal:** Passengers should be informed that **they can lodge food-related grievances on the FSSAI's Food Safety Connect App.**

Surveillance and Inspection:

- **Supply Chain Inspection:** FSSAI has conducted a **surveillance drive to inspect the supply chain** of food served to in-flight passengers.
- **Observations:** Discrepancies were observed in the description of "Kind of Business" in the FSSAI licenses of flight kitchen operators.
- **Food Preparation:** Food is prepared by flight kitchen operators located near airports and **then transported to flights through specialized vehicles like insulated refrigerated vans/wagons.**

Licensing Clarifications:

- **Kind of Business:** Flight kitchen operators are asked to describe themselves as "food services (caterer)" in their FSSAI license applications.
- **Separate License:** Firms transporting food to flights from flight kitchens must obtain a separate FSSAI license.
- **Single License for Airlines:** Airlines can obtain one FSSAI license instead of separate licenses in different states.
- **Pre-Packaged Food:** Airlines selling pre-packaged food should indicate themselves as "retailer" in the license.
- **Manufacturing or Importing:** Airlines getting pre-packaged food products manufactured or imported under their brand name should obtain an appropriate manufacturing or importer license.
- **Storage of Food:** Airlines involved in storing food also need to obtain a separate FSSAI license.

Compliance and Enforcement:

- The FSSAI advisory aims to ensure that **airlines and food service providers comply with food safety regulations, maintain transparency in labeling, and provide passengers with safe and hygienic food during flights.**

The advisory from FSSAI underscores the **importance of food safety, proper labeling, and compliance with regulations to protect the health and well-being of airline passengers.** Airlines are urged to adhere to these guidelines to maintain high standards of food safety and hygiene.

About Food Safety and Standards Authority of India (FSSAI)

The Food Safety and Standards Authority of India (FSSAI) is an **autonomous statutory body established under the Food Safety and Standards Act of 2006.**

Establishment and Mandate:

- **Establishment:** FSSAI was established to consolidate various laws related to food safety and standards in India. **The Act of 2006 brought together laws such as the Prevention of Food Adulteration Act, 1954, the Fruit Products Order, 1955, the Meat Food Products Order, 1973, and others.**
- **Central Reference Point:** The Act aimed to establish a single reference point for all matters relating to food safety and standards.
- **Responsibilities:** FSSAI is responsible for **protecting and promoting public health by regulating and supervising food safety and quality in India.**
- It operates under the Ministry of Health & Family Welfare.

Organizational Structure:

- **Headquarters:** FSSAI has its headquarters in **New Delhi.**
- **Regional Offices:** It has regional offices in eight zones across the country to facilitate efficient monitoring and enforcement.
- **Leadership:** The Chairperson and Chief Executive Officer of FSSAI are appointed by the central government. **The Chairperson holds the rank of Secretary to the Government of India.**

Functions and Powers:

- **Regulations and Standards:** FSSAI frames regulations and standards for various food products and additives to ensure safety and quality.
- **Licensing and Registration:** It grants licenses and registrations to food businesses after ensuring compliance with standards.
- **Enforcement:** FSSAI enforces food safety laws and regulations through monitoring, surveillance, and inspections.
- **Risk Assessment:** The authority conducts risk assessment and scientific research on food safety issues to guide its policies.

- **Training and Awareness:** FSSAI provides training and awareness programs on food safety and hygiene to stakeholders.
- **Promotion of Food Fortification:** It promotes initiatives such as food fortification and the consumption of organic food.
- **Coordination:** FSSAI collaborates with other agencies and stakeholders on food safety matters to ensure a holistic approach.

Events and Campaigns:

- **World Food Safety Day:** FSSAI observes and promotes World Food Safety Day to raise awareness about safe and nutritious food.
- **Eat Right India:** This campaign aims to promote healthy eating habits and lifestyle choices.
- **Eat Right Station:** FSSAI's initiative to ensure availability of healthy food options at railway stations.
- **Eat Right Mela:** Events organized to promote awareness about food safety and nutrition.
- **State Food Safety Index:** A tool to measure and rank states based on their food safety performance.
- **RUCO (Repurpose Used Cooking Oil):** FSSAI's initiative to **collect and convert used cooking oil into biodiesel.**
- **Food Safety Mitra:** A scheme to engage and train individuals as food safety supervisors.
- **100 Food Streets:** A project to **promote safe and hygienic street food vending.**

About Bureau of Indian Standards (BIS):

- **National Standard Body:** BIS is the National Standard Body of India established under the BIS Act 2016.
- **Responsibilities:** It oversees the harmonious development of **standardization, marking, and quality certification of goods.**
- **Consumer Protection:** The BIS Act empowers the government to **authorize agencies beyond BIS for certification and enforcement of standards, enhancing consumer protection.**
- **Headquarters:** BIS has its headquarters in New Delhi.

Agricultural Marketing (AGMARK):

- **Certification Mark:** AGMARK is a **certification mark for agricultural produce**, ensuring conformity to specified grade standards.
- **Mandate:** It assures **quality and differentiates between grades for various** agricultural commodities.
- **Grade Standards:** DMI under the **Ministry of Agriculture & Farmers Welfare** notifies grade standards for agricultural products.

EC quits, Commission down to one; PM panel to meet next week to fill vacancies

Section: National Body

Context:

- Barely days before the 2024 Lok Sabha elections were expected to be **announced, Election Commissioner Arun Goel resigned.**

More on news:

- **Goel's resignation as Election Commissioner** is only the third instance in the poll watchdog's history.

About Election Commission:

- **The Election Commission of India** is an autonomous constitutional authority responsible for administering Union and State election processes in India.
- The body administers elections to the **Lok Sabha, Rajya Sabha, and State Legislative Assemblies in India**, and the offices of the President and Vice President in the country.
- **Part XV of the Indian constitution** deals with elections, and establishes a commission for these matters.
- **Article 324 to 329 of the constitution** deals with powers, function, tenure, eligibility, etc of the commission and the member

Appointment of Election Commissioners:

- **The CEC and ECs will be appointed by the President** upon the recommendation of a Selection Committee.
- Appointment of the Commission: The **Commission will be appointed by the President**, upon the recommendation of the **Selection Committee.**
- The Selection Committee will comprise the **Prime Minister, Cabinet Minister, and Leader of Opposition in Lok Sabha (or leader of the single largest opposition party).**
- A Search Committee headed by the **Cabinet Secretary will suggest five names to the Selection Committee.**

- The Selection Committee may consider any person other than those suggested by the Search Committee.
- Recommendations of the Selection Committee will be valid even when there is a vacancy in this Committee.
- Eligibility for the posts includes holding (or having held) a post equivalent to the Secretary to the central government.
- The salary and conditions of service of the CEC and ECs will be equivalent to that of Cabinet Secretary. Under the 1991 Act, it was equivalent to the salary of a Supreme Court Judge.

Term and reappointment:

- **Members of the Election Commission** will hold office for six years, or until they attain the **age of 65 years**, whichever is earlier.
- Members of the **Commission cannot be re-appointed**.
- If an **EC is appointed as a CEC**, the overall period of the term may not be more than six years.

Salary and pension:

- The **salary, allowances**, and other conditions of service of the **CEC and ECs** will be **equivalent** to that of the **Cabinet Secretary**.
- They will have an option to draw pension and other retirement benefits from the service that they belonged to previously.

Removal:

- The **CEC** may be **removed** in the **same manner** and on the same grounds as a **Supreme Court Judge**.
- **ECs** may be **removed only upon the recommendation of the CEC**.

Centre ensures place for Madiga member in Scheduled Caste panel

Section: National Body

Context:

- The **Union government** has formed the latest **National Commission for Scheduled Castes (NCSC)**, focusing on **including members from underrepresented communities**, particularly ensuring **at least one member from the Madiga community**, significantly present in **Telangana and Andhra Pradesh**.

Details:

- The **Ministry of Social Justice** announced the appointments, naming **BJP Gujarat spokesperson Kishor Makwana** as the **NCSC Chairperson**.
- **Vadepally Ramchander** from **Telangana** and **Love Kush Kumar** from **Uttar Pradesh** have been appointed as **members**.
- **Vadepally Ramchander's** inclusion is notable following the government's move to form an internal committee **aimed** at the **sub-categorisation of Scheduled Castes**, addressing a **long-standing demand** from the **Madiga community for equitable distribution of benefits and reservation**.
- The acting chairperson was **Arun Halder**.

About the Madiga community:

- The Madiga community is a **Telugu caste** from **southern India**, primarily residing in the states of **Andhra Pradesh, Telangana, and Karnataka**, with a **small minority in Tamil Nadu**. Historically, they were associated with **tannery, leatherwork, and small handicrafts**. Today, most are **agricultural labourers**.
- The community is **categorized** as a **Scheduled Caste** by the **Government of India**.
- **Their concern:**
 - The **Madiga community** has voiced concerns over being **marginalized** in favour of the **Mala community**, despite their **significant numbers within the Scheduled Castes**.
 - The government's initiative to explore **sub-categorisation** aims to **ensure fair access to benefits for the most backwards among the SCs**, though the **Supreme Court** has yet to rule on the feasibility of **SC quota sub-categorisation**.

What is the sub-categorization of SC groups?

- **Sub-categorization** involves **classifying existing SC caste groups** into **further categories** based on their **historical dominance in availing government benefits meant for SCs**.
- It aims to **ensure a more equitable distribution of benefits among SC communities** by giving **higher shares to historically marginalized groups** and lesser shares to those that have **traditionally dominated such benefits**.

- NCSC is a **constitutional body** that works to safeguard the interests of the **scheduled castes (SC) in India**.
- **Article 338** of the constitution of India deals with this commission:
- It provides for a **National Commission for the Scheduled Castes and Scheduled Tribes** with duties to investigate and monitor all matters relating to safeguards provided for them, to inquire into specific complaints and to participate and advise on the planning process of their socio-economic development etc.

Its evolution

- **Special Officer:**
 - Initially, the constitution provided for the appointment of a Special Officer under Article 338.
 - The special officer was designated as the Commissioner for Scheduled Castes and Scheduled Tribes.
- **65th Amendment, 1990:**
 - It replaced the one-member system with a multi-member National Commission for Scheduled Castes (SC) and Scheduled Tribes (ST).
 - The Constitution (65th Amendment) Act 1990, amended Article 338 of the Constitution.
- **89th Amendment, 2003:**
 - By this amendment, the erstwhile National Commission for SC and ST was replaced by two separate Commissions from the year 2004 which were: National Commission for Scheduled Castes (NCSC) and National Commission for Scheduled Tribes (NCST)- under Article 338-A.

Structure –

- Chairperson.
- Vice-chairperson.
- Three other members.

They are appointed by the President by warrant under his hand and seal.

Functions –

- Monitoring and investigating all issues concerning the safeguards provided for the SCs under the constitution.
- Enquiring into complaints relating to the deprivation of the rights and safeguards of the SCs.
- Taking part in and advising the central or state governments with respect to the planning of socio-economic development of the SCs.
- Regular reporting to the President of the country on the implementation of these safeguards.
- Recommending steps to be taken to further the socio-economic development and other welfare activities of the SCs.
- Any other function with respect to the welfare, protection, development and advancement of the SC community.

On CEC's solitary vigil, Supreme Court had said 'two heads better than one'

Section: National Body

Context:

- Chief Election Commissioner (CEC) Rajiv Kumar is in sole charge of the Election Commission (EC) with the resignation of Election Commissioner Arun Goel ahead of the Lok Sabha polls' announcement.

More on news:

- The Supreme Court, in **S.S. Dhanoa versus Union of India**, said one person at the helm of the powerful poll body was against the **"tenets of democratic rule"**.

Seshan case verdict:

- The Election Commission can therefore be a single-member body or a multi-member body if the President considers it necessary to appoint one or more Election Commissioners.
- The Constitution Bench was **interpreting clause 2 of Article 324, which said that the Election Commission** shall consist of the Chief Election Commissioner and such number of other Election Commissioners, if any, as the President may from time-to-time fix.
- Our Constitution-makers have provided for a multi-member body.
- The plain language of **Article 324(2) envisages a multi-member Commission**

About Election Commission:

- **The Election Commission of India** is an autonomous constitutional authority responsible for administering Union and State election processes in India.
- The body administers elections to the **Lok Sabha, Rajya Sabha, and State Legislative Assemblies in India**, and the offices of the President and Vice President in the country.
- **Part XV of the Indian constitution** deals with elections, and establishes a commission for these matters.
- **Article 324 to 329 of the constitution** deals with powers, function, tenure, eligibility, etc of the commission and the member

Appointment of Election Commissioners:

- **The CEC and ECs will be appointed by the President** upon the recommendation of a Selection Committee.
- Appointment of the Commission: The **Commission will be appointed by the President**, upon the recommendation of the **Selection Committee**.
- The Selection Committee will comprise the **Prime Minister, Cabinet Minister, and Leader of Opposition in Lok Sabha (or leader of the single largest opposition party)**.
- A Search Committee headed by the **Cabinet Secretary will suggest five names to the Selection Committee**.
- The Selection Committee may consider any person other than those suggested by the Search Committee.

Term and reappointment:

- **Members of the Election Commission** will hold office for six years, or until they attain the **age of 65 years**, whichever is earlier.
- Members of the **Commission cannot be re-appointed**.
- If an **EC is appointed as a CEC**, the overall period of the term may not be more than six years.

Salary and pension:

- The **salary, allowances**, and other conditions of service of the **CEC and ECs** will be **equivalent** to that of the **Cabinet Secretary**.
- They will have an option to draw pension and other retirement benefits from the service that they belonged to previously.

Removal:

- The **CEC** may be **removed** in the **same manner** and on the same grounds as a **Supreme Court Judge**.
- **ECs** may be **removed only upon the recommendation of the CEC**.

Public Health Foundation of India surpasses Harvard, bags second place in global rankings for schools of public health

Section: National body

Context:

- In the first global rankings for schools of public health, the Public Health Foundation of India (PHFI) has secured an impressive second place, surpassing Harvard.

More on news:

- The leading five institutions in the list include the London School of Hygiene and Tropical Medicine, the Public Health Foundation of India (PHFI), Harvard T.H. Chan School of Public Health, the Swiss School of Public Health (SSPH+) and the Johns Hopkins Bloomberg School of Public Health.
- The rankings are part of a report titled '**A New Model for Ranking Schools of Public Health: The Public Health Academic Ranking (PHAR)**' published in the International Journal of Public Health.

About PHAR:

- The **PHAR is the first international bibliometric university** ranking system designed for academic public health.
- The project was funded by the **Institute of Global Health, University of Geneva**.

About Public Health Foundation of India (PHFI):

- The **Public Health Foundation of India (PHFI)** is a **not for profit public private initiative** working towards a healthier India.
- It was established on **28 March 2006**.
- **The Public Health Foundation of India (PHFI)** is a **public private initiative** that has collaboratively evolved through consultations with multiple constituencies including Indian and international academia, state and central governments, multi & bi-lateral agencies and civil society groups.

President appoints former IAS officers Gyanesh Kumar, Sukhbir Singh Sandhu as new Election Commissioners

Section: National Body

Context:

- **President Droupadi Murmu** appointed **retired IAS officers Gyanesh Kumar** and **Sukhbir Singh Sandhu** as **new Election Commissioners**, based on the **recommendations** of a **selection panel** led by **Prime Minister Narendra Modi**.

Details:

- These appointments filled vacancies left by the retirement of **Anup Chandra Pandey** and the resignation of **Arun Goel**.
- **Gyanesh Kumar** is set to become the **Chief Election Commissioner** in **February 2025**.
 - **Gyanesh Kumar**, a 1988 Kerala cadre IAS officer, has previously worked with Union Home Minister Amit Shah and retired as the Secretary of the Ministry of Cooperation.
 - **Sukhbir Singh Sandhu**, from the 1998 Uttarakhand cadre, has served as Uttarakhand's Chief Secretary under Chief Minister Pushkar Singh Dhama.
- The **selection process** involved a **search committee** led by the **Union Law Minister** and a **final selection panel** including the **Prime Minister, the Leader of the Opposition in Lok Sabha, and a Union Minister**.

Election Commission of India (ECI)

- The Election Commission of India is an autonomous constitutional authority responsible for administering Union and State election processes in India. The body administers elections to the Lok Sabha, Rajya Sabha, State Legislative Assemblies in India, and the offices of the President and Vice President in the country.
- Election Commission of India is a permanent Constitutional Body. The Election Commission was established in accordance with the Constitution on 25th January 1950. The Commission celebrated its Golden Jubilee in 2001.
- Originally the commission had only a Chief Election Commissioner. It currently consists of Chief Election Commissioner and two Election Commissioners.
- For the first time two additional Commissioners were appointed on 16th October 1989 but they had a very short tenure till 1st January 1990. Later, on 1st October 1993 two additional Election Commissioners were appointed. The concept of multi-member Commission has been in operation since then, with decision making power by majority vote.

Rajya Sabha polls BJP gains in U.P., Himachal Pradesh amid cross-voting

Section: Parliament

Context:

- Rajya Sabha polls in Uttar Pradesh and Himachal Pradesh went down to the wire, with heavy cross-voting by Samajwadi Party (SP) and Congress MLAs respectively, and the BJP walking away with two extra seats than its Assembly strength permitted.

More on news:

- The June **1998 Rajya Sabha elections in Maharashtra** witnessed cross-voting that resulted in the loss of a Congress party candidate

Legal Provisions:

- As per **Article 80 of the Constitution**, representatives of each State to the Rajya Sabha are elected indirectly by the elected members of their Legislative Assembly.
- In order to rein in the MLAs from such cross-voting, an amendment to the **Representation of the People Act, 1951** was **carried out in 2003**.
- **Section 59 of the Act** was amended to provide that the voting in elections to Rajya Sabha shall be through an open ballot.

What does the Tenth Schedule state?

- The **52nd constitutional amendment** introduced the 'anti-defection' law through the **Tenth Schedule in 1985**.
- This **Schedule provides that a member of a House of Parliament or State legislature who voluntarily gives up the membership of their political party or votes against the instructions** of their party in a House are liable for disqualification from such House.
- This instruction with respect to voting is issued by the '**whip**' of a party.
- However, the elections to **Rajya Sabha are not treated as a proceeding within the Legislative Assembly**.
- The Election Commission, drawing reference to Supreme Court judgments, had issued a clarification in July 2017.

- It specified that the provisions of the **Tenth Schedule, with respect to voting against the instruction of the party, will not be applicable for a Rajya Sabha election.**
- Furthermore, political parties cannot issue any 'whip' to its members for such elections.

What is Cross Voting:

- Cross voting in Rajya Sabha polls **refers to the phenomenon where a legislator**, typically a member of a legislative assembly (MLA), votes for a candidate who does not belong to the political party or alliance to which the legislator is affiliated.
- **Rajya Sabha, the upper house of the Parliament of India, is not directly elected by the public** but by the elected members of the State Legislative Assemblies.
- In Rajya Sabha elections, **each state's MLAs cast their votes to elect representatives to the Rajya Sabha.**
- The number of seats allocated to a state is determined by its population.
- **Cross voting occurs when a legislator** goes against the party's designated candidate and votes for a candidate from another political party or an independent candidate.

Reasons for Cross Voting:

- **Conscience Voting:** Legislators may choose to vote according to their individual conscience, beliefs, or evaluation of the candidate's qualifications, rather than strictly adhering to party lines.
- **Political Alliances and Rivalries:** Complex political dynamics, alliances, or rivalries within a state or among political parties can lead to instances of cross voting.
- **Personal Agendas:** Legislators may have personal or local issues that influence their voting decisions, leading them to support candidates or parties that align with their specific concerns.
- **Internal Party Conflicts:** Internal conflicts within a political party, dissatisfaction with party decisions, or disagreements with leadership can motivate legislators to cross vote.

Immunity won't protect legislators taking bribes to vote in Parliament from criminal prosecution: Supreme Court

Section: Parliament

Context:

- The **Supreme Court of India**, led by a **seven-judge Bench**, delivered a **unanimous decision** stating that **parliamentary privilege or immunity does not shield legislators from criminal prosecution for bribery related to voting or speaking in Parliament or State Legislative Assemblies.**

Historical Overruling:

- This ruling overturns a **1998 Supreme Court decision** (the **JMM bribery case judgment**) that previously **granted lawmakers immunity from corruption prosecution** if their **bribed actions were executed as part of their legislative functions.**
- **Chief Justice of India's Observations:**
 - The **Chief Justice** emphasized that **privileges and immunities** should not be used to **evade the general law**, highlighting that **corruption undermines the essence of Indian parliamentary democracy.**
 - He clarified that the **act of bribery is considered complete once the corruption money is accepted**, irrespective of the **legislator's subsequent actions within the House.**

Implications for Parliamentary Immunity:

- The Court **rejected** the notion that **reducing parliamentary immunity** would **unjustly expose opposition members to a criminal investigation**, arguing instead that **bribed lawmakers compromise the constitution's aspirational and deliberative ideals**, thereby weakening democracy.
- **Criteria for Immunity:**
 - The judgment specified that **parliamentary immunity** could only be **invoked to preserve the dignity and authority of the legislative body** or in the **exercise of a legislator's rights to free speech and protest.**
 - Any claim for immunity that does not meet these criteria would not be accepted.
 - The Court recognized that **criminal courts and legislative houses** have **concurrent jurisdiction over bribery allegations**, stating that **one does not negate the jurisdiction of the other.**

Background of the Appeal:

- The ruling came in response to an appeal by **JMM leader Sita Soren**, accused of accepting a **bribe** during the **2012 Rajya Sabha elections.**

- The case revisited the controversial **JMM bribery scandal of 1993** involving **payments to MPs**, including **Sita Soren's relatives**, to secure their votes during a **no-confidence motion** against the then government.
- **Reaffirmation of Rule of Law:** Chief Justice Chandrachud concluded that **granting MPs immunity from bribery prosecution would undermine parliamentary democracy and contravene the rule of law**, firmly positioning the **judiciary against corruption within legislative bodies**.

Parliamentary Privileges:

- Parliamentary privileges are **special rights, immunities and exemptions** enjoyed by the **two Houses of Parliament**, their **committees and their members**.
- These privileges are defined in **Article 105** of the **Indian Constitution**.
- Under these privileges, the **members of Parliament** are **exempted from any civil liability (but not criminal liability)** for any statement made or act done in the course of their duties.
- The privileges are **claimed only when the person is a member of the house**.
- As soon as s/he ends up being a member, the privileges are said to be called off.
- **Parliament has not made any special law to exhaustively codify all the privileges.** They are rather based on **five sources**:
 - Constitutional provisions
 - Various laws made by Parliament
 - Rules of both the Houses
 - Parliamentary conventions
 - Judicial interpretations

Privileges:

- **Freedom of Speech in Parliament:**
 - The freedom of speech and expression guaranteed to a citizen under Article 19(2) is different from the freedom of speech and expression provided to a member of the parliament.
 - It has been guaranteed under Article 105(1) of the Indian constitution. But the freedom is subject to rules and orders which regulate the proceedings of the parliament.
 - **Limitations:**
 - Freedom of speech should be in accordance with the constitutional provisions and subject to rules and procedures of the parliament, as stated under **Article 118** of the Constitution.
 - Under **Article 121** of the Constitution, the members of the parliament are restricted from discussing the conduct of the **judges of the Supreme Court and the High Court**.
- **Freedom from Arrest:**
 - The members enjoy **freedom from arrest** in any civil case **40 days before and after** the adjournment of the house and also when the house is in session.
 - No member can be arrested from the **limits of the parliament without the permission of the house** to which s/he belongs so that there is no hindrance in performing their duties.
 - If the detention of any members of the parliament is made, the chairman or the speaker should be informed by the concerned authority, of the reason for the arrest.
 - But a member can be arrested outside the limits of the house on criminal charges against him under the **Preventive Detention Act, the Essential Services Maintenance Act (ESMA), the National Security Act (NSA)**, or any such act.
- **Right to Prohibit the Publication of Proceedings:**
 - **Article 105(2)** of the Constitution, no person shall be held liable for publishing any reports, discussions etc. of the house under the authority of the member of the house.
 - For paramount and national importance, it is essential that the proceedings should be communicated to the public to aware them of what is going on in the parliament.
- **Right to Exclude Strangers:**
 - The members of the house have the power and right to exclude strangers who are not members of the house from the proceedings. This right is very essential for securing free and fair discussion in the house.

Kerala challenges withholding of Presidential assent to State bills in Supreme Court

Section: Parliament and Legislature

Context:

- In an unprecedented move, **the Kerala Government on March 23 filed** an appeal in the Supreme Court as President Droupadi Murmu has withheld assent for four Bills passed by the Kerala Legislature without disclosing any reasons.

More on news:

- It has also moved the Court against **Kerala Governor Arif Mohammed Khan's** office for keeping the Bills pending for a long and indefinite period, and later reserving them for the consideration of the President.
- The act of the **President in withholding the assent for the four Bills without giving any reason was highly arbitrary and in violation of Articles 14, 200 and 201 of the Constitution.**
- The reference of the seven Bills to the President has to be recalled on the grounds of Constitutional morality.

State Government's views:

- The State contends that the actions of the Union Government in advising the **President to withhold assent to Bills passed by the Legislative Assembly 11 to 24 months back**, which were wholly within the domain of the State Government, subverted and disrupted the federal structure of the Constitution.
- It was also a grave encroachment into the domain entrusted to the State under the Constitution.

Reservation of Bills under Article 201:

Article 201 (Bills reserved for consideration)

- When a **Bill is reserved by a Governor for the consideration of the President**, the President shall declare either that he assents to the Bill or that he withholds assent therefrom.
- Notably, **there is no specified timeframe for the President to decide on the Bill's outcome.**
- Provided that, where the **Bill is not a Money Bill, the President** may direct the **Governor to return the Bill to the House** or, as the case may be, the Houses of the Legislature of the State together with such a message as is mentioned in the **first provision to Article 200.**
- When a Bill is so returned, **the House or Houses shall reconsider it accordingly within a period of six months from the date of receipt of such message** and, if it is again passed by the House or Houses with or without amendment, it shall be presented again to the President for his consideration.

Schemes

Workshop on 'Count of Pastoralists and their Livestock in 21st Livestock Census'

Section: Agri

Context:

- The **Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying** organized a workshop on 'Count of Pastoralists and their Livestock in 21st Livestock Census' in Indore, Madhya Pradesh.

About Livestock Census:

- The **Department of Animal Husbandry and Dairying** conducts livestock census across the country every 5 years since **1919.**
- The last livestock census i.e. **20th LC** was conducted in **2019.**
- The **21st livestock census is due in 2024.**
- There is a demand to collect the information on **Pastoralists and their livestock in 21st Livestock Census.**
- The livestock census is the main source of data for proper planning and formulation of the **Livestock Welfare Programme for bringing further improvement in this sector.**
- The livestock census usually covers all domestic animals and head counts of these animals which includes various species of animals (**cattle, buffalo, mithun, yak, sheep, goat, pig, horse, pony, mule, donkey, camel, dog, rabbit and elephant**)/poultry birds (**fowl, duck and other poultry birds**) possessed by the households, household enterprises/non-household enterprises at that site Breed-wise with their age, sex.

Cabinet Approves Ambitious India AI Mission to Strengthen the AI Innovation Ecosystem

Section: Computer

Context:

- In furtherance to the vision of **Making AI in India and Making AI Work for India**, the Cabinet chaired by the Prime Minister Shri Narendra Modi has approved the comprehensive national-level India AI mission with a budget outlay of Rs.10,371.92 crore.

More on news:

- The Mission will be implemented by '**India AI**' **Independent Business Division (IBD)** under **Digital India Corporation (DIC)**.

Components under the mission:

IndiaAI Compute Capacity:

- The IndiaAI compute pillar will build a high-end scalable AI computing ecosystem to cater to the increasing demands from India's rapidly expanding AI start-ups and research ecosystem.
- The ecosystem will comprise AI compute infrastructure of 10,000 or more Graphics Processing Units (GPUs), built through public-private partnership.
- An AI marketplace will be designed to offer AI as a service and pre-trained models to AI innovators.
- It will act as a one-stop solution for resources critical for AI innovation.

IndiaAI Innovation Centre:

- The IndiaAI Innovation Centre will undertake the development and deployment of indigenous Large Multimodal Models (LMMs) and domain-specific foundational models in critical sectors.

IndiaAI Datasets Platform:

- The IndiaAI Datasets Platform will streamline access to quality non-personal datasets for AI Innovation.
- A unified data platform will be developed to provide a one-stop solution for seamless access to non-personal datasets to Indian Startups and Researchers.

IndiaAI Application Development Initiative:

- The IndiaAI Application Development Initiative will promote the AI applications in critical sectors for the problem statements sourced from Central Ministries, State Departments, and other institutions.
- The initiative will focus on developing/scaling/promoting adoption of impactful AI solutions with potential for catalyzing large scale socio-economic transformation.

IndiaAIFutureSkills:

- IndiaAIFutureSkills is conceptualized to mitigate barriers to entry into AI programs and will increase AI courses in undergraduate, masters-level, and Ph.D. programs.
- Further, Data and AI Labs will be set-up in Tier 2 and Tier 3 cities across India to impart foundational level courses.

IndiaAI Startup Financing:

- The IndiaAI Startup Financing pillar is conceptualized to support and accelerate deep-tech AI startups and provide them streamlined access to funding to enable futuristic AI Projects.

Safe & Trusted AI:

- Recognizing the need for adequate guardrails to advance the responsible development, deployment, and adoption of AI, the Safe & Trusted AI pillar will enable the implementation of Responsible AI projects including the development of indigenous tools and frameworks, self-assessment checklists for innovators, and other guidelines and governance frameworks.

Center issues directive to prevent tailgating at airport e-gates

Section: Economy

Context:

The Bureau of Civil Aviation Security (BCAS) has asked airports and airlines to **use better technology and assign more manpower resources** to prevent passengers from tailgating through automatic gates at various check-points.

What is tailgating (piggybacking)?

- Tailgating, sometimes referred to as piggybacking, is a type of physical security breach in which an unauthorized person follows an authorized individual to enter secured premises.
- Tailgating is one of the simplest forms of a social engineering attack.
- It is an easy way for an unauthorized party to get around security mechanisms that are assumed to be secure

More on news:

- The government directive follows **two serious security breaches within a span of 10 days** in February, when ticketless travelers were able to enter the passenger building at Mumbai airport and even enter the boarding gate.
- **Digi Yatra, a biometric-based boarding system**, which allows passengers to use their facial scan as a ticket, has been rolled out at 13 airports so far and 24 more airports will get the facility in 2024.
- **E-gate manufacturers have been asked to improve their technology to ensure that two passengers cannot pass through them at the same time.**

About Digi Yatra:

- The project is being implemented by the DigiYatra Foundation — **a joint-venture company whose shareholders are the Airports Authority of India (26% stake) and Bengaluru Airport, Delhi Airport, Hyderabad Airport, Mumbai Airport and Cochin International Airport hold the remaining 74% of the shares.**
- In the first phase, the initiative will be launched at seven airports, starting with three —Delhi, Bengaluru, and Varanasi, followed by four airports namely Hyderabad, Kolkata, Pune, and Vijayawada by March 2023.
- The facial recognition system at various airports across the globe, including Dubai, Singapore, Atlanta and Narita (Japan), have helped bring in efficiency.

Key features of the initiative and how it works–

- **Centralized registration system for passengers** and each of them would get a unique ID on booking the tickets
- **ID can be created by sharing name, e-mail id, mobile number and details of any identity proof, including Aadhaar**
- The airline would share the **passenger data and the ID** with the airport from where the passenger would be flying out
- **Optionally linking of Aadhaar to airlines** at the time of booking for faster airport entry and automated check-ins without requiring any paper-based interventions
- **A biometrics-based digital processing system** for passenger entry and related requirements at the airport
- Voluntary for passengers on whether to opt for facial recognition biometric for air travel
- The Digi Yatra platform would be **operational by February 2019**
- Will be available at **major airports in the country**
- Real-time notifications about congestion and delays of flights
- Passengers would be notified when their luggage reaches the baggage claim belt.

Cabinet approves Uttar Poorva Transformative Industrialization Scheme 2024

Section: Economy

Context:

- The Union Cabinet chaired by Prime Minister Shri Narendra Modi approved the proposal of the Ministry of Commerce and Industry, **Department for Promotion of Industry and Internal Trade for Uttar Poorva Transformative Industrialization Scheme, 2024 (UNNATI – 2024)** for a period of 10 years from the date of notification along with 8 years for committed liabilities at a total cost of Rs.10,037 crore.

About the scheme:

- **Government of India has formulated New Industrial Development Scheme, UNNATI (Uttar Poorva Transformative Industrialization Scheme), 2024** as a Central Sector Scheme for the development of Industries and generation of employment in the states of North East Region.
- The scheme's main objective is to generate gainful employment, which will lead to the area's overall socio-economic development.
- It will create productive economic activity in the **manufacturing and service sectors.**
- This will be a **Central Sector Scheme.**

Salient features of the scheme:

- **Scheme period:** The scheme will be effective from the date of Notification and up to 31.03.2034 along with **8 years of committed liabilities.**
- **Application period for registration:** Industrial unit will be allowed to apply for registration from the date of notification up to 31.03.2026
- **Grant of registration:** All applications for registration shall have to be disposed of by 31.03.2027

- **Commencement of Production or operation:** All eligible Industrial Units to commence their **production** or operation within 4 years from the grant of registration.
- **Districts are categorized in two zones:** Zone A (Industrially Advanced Districts) & Zone B (Industrially Backward Districts)
- **Earmarking of funds:** 60% of the outlay of Part A has been earmarked to 8 NE states and 40% on First-In-First-Out (FIFO) basis.
- **For Micro industries (defined as per MSME industry norms),** the P&M calculation will include the building construction and P&M costs for Capital Investment Incentive.
- **All new Industrial units and Expanding units** would be eligible for the respective incentives.

Implementation strategy:

- **DPIIT** will implement the scheme in cooperation with the states. Implementation will be overseen by following committees at the national and state levels.
- **The Steering Committee, headed by the Secretary, DPIIT (SIIT),** will decide upon any interpretation of the scheme within its overall financial outlay and issue detailed guidelines for execution.
- **The State Level Committee, headed by the state's Chief Secretary,** will monitor implementation, checks and balances, ensuring transparency and efficiency.
- The Secretary Level Committee, headed by the senior Secretary of the state (Industries), will be responsible for implementing the scheme, including the recommendation of registration and incentives claims.

Incentives under the scheme:

Where GST is applicable	Where GST is not applicable
Capital Investment Incentive (For Both New & Expanding Units): Zone A: 30% of eligible value of investment in plant and machinery / construction of building & durable physical assets with cap of Rs. 5Cr. Zone B: 50% of eligible value of investment in plant and machinery / construction of building & durable physical assets with cap of Rs. 7.5 Cr.	Capital Investment Incentive (For Both New & Expanding Units): Zone A: 30% of eligible value of investment in plant and machinery / construction of building & durable physical assets with cap of Rs. 10 Cr. Zone B: 50% of eligible value of investment in plant and machinery / construction of building & durable physical assets with cap of Rs. 10 Cr.
Central Capital Interest Subvention (For Both New & Expanding Units): Zone A: 3% interest subvention offered for 7 years Zone B: 5% interest subvention offered for 7 years	Central Capital Interest Subvention (For Both New & Expanding Units): Zone A: 3% interest subvention offered for 7 years Zone B: 5% interest subvention offered for 7 years
Manufacturing & Services linked incentive (MSLI)– For New Units only – linked to Net Payment of GST, i.e., GST paid less Input Tax Credit with upper limit of Zone A: 75% of eligible value of investment in P&M Zone B: 100% of eligible value of investment in P&M	Nil

Maximum Eligible benefits to one unit from all components of the scheme: Rs. 250 Cr.

GeM Encouraging Start-ups and Small Enterprises

Section: Economy

The Government e-Marketplace (GeM), the Union government's procurement portal, is actively working to promote the participation of start-ups and small enterprises as sellers.

- **Inclusion of Start-ups:**
 - Since its inception, almost 23,000 start-ups have registered on the GeM platform.
 - GeM has been a **successful digital initiative of the Indian government, with the gross merchandise value (GMV) expected to cross the ₹4-lakh crore mark this year,** up from ₹422 crore in 2016.
- **Seller Base:**

- GeM boasts a diverse seller base of 21 lakh, including a significant number of small and micro-enterprises.
- The **platform caters to 1.5 lakh buyers across all tiers of government - Central, State, and local.**
- **GeM Sahay 2.0:**
 - GeM is introducing **GeM Sahay 2.0, a mobile-based lending platform aimed at supporting start-ups.**
 - This initiative **offers collateral-free loans of up to ₹10 lakh to start-ups and entrepreneurs.**
 - Loans will be **provided at interest rates of up to 10% and will be approved within just 10 minutes.**
- **Market Linkages:**
 - GeM provides easy market linkages for start-ups, exempting them from certain listing requirements.
 - The platform **serves as a marketplace where start-ups fulfilled 84,000 orders worth ₹9,725 crore in the previous year.**
- **Start-up Runway Initiative:**
 - GeM's '**Start-up Runway**' initiative offers direct visibility to start-ups with the buyers on the public procurement portal.
 - This program **encourages start-ups to showcase their offerings and engage with potential buyers effectively.**

Conclusion

GeM's efforts to onboard and support start-ups and small enterprises reflect the government's commitment to promoting entrepreneurship and facilitating business growth.

With GeM Sahay 2.0 offering quick and hassle-free loans, and initiatives like Start-up Runway enhancing visibility, the platform aims to create a conducive environment for start-up success in the public procurement space.

GeM Sahay: Empowering Proprietorships on Government e-Marketplace (GeM)

Introduction:

- GeM Sahay is an **innovative initiative launched by the Government e-Marketplace (GeM).**
- It **offers a comprehensive financing solution tailored for Proprietorships operating on the GeM platform.**

Partnerships:

- GeM has collaborated with top financial lending banks to facilitate these loans.
- **Proprietorships can access loans at the point of order acceptance, ensuring timely financial support.**

Registration:

- Easy registration process via Udyam and Aadhar, free of charge.
- Proprietorships can seamlessly apply for loans with minimal paperwork, enhancing convenience.

Interest Rates:

- Loans offered through GeM Sahay come with competitive interest rates.
- Proprietorships benefit from favourable terms, making financing more accessible and affordable.

Through GeM Sahay, **GeM is poised to transform the financing experience for Proprietorships, fostering a conducive environment for business expansion and success.** This initiative reflects GeM's dedication to innovation, efficiency, and support for the entrepreneurial ecosystem in India.

GeM Startup Runway Program: Fostering Growth for Startups

- The GeM Startup Runway Program is an **initiative by the Government e-Marketplace (GeM) to support and promote startups in India.**
- It aims to **provide direct visibility and business opportunities to startups on the GeM platform.**
- The program is designed to **empower startups by offering them a dedicated platform to showcase their products and services.**
- It **facilitates easy access to government buyers and procurement opportunities, accelerating the growth of startups.**

Nutritional crisis: India has most 'zero-food' children at 6.7 million; third highest prevalence among 92 LMICs

Section: Health

Context:

- A recent study highlights the **alarming prevalence of children aged 6-23 months in 92 low- and middle-income countries (LMIC) who did not consume any food over 24 hours.**

Definition of 'Zero-food' Children:

- 'Zero-food' children refer to those who **did not consume any animal milk, formula, or solid or semisolid food during the last 24 hours.**
- This category is **critical** because, at **approximately six months of age, breastfeeding alone is insufficient to meet the nutritional needs of a child.**
- Introducing **solid or semisolid foods** alongside breastfeeding is essential for fulfilling the nutritional needs of early childhood, playing a pivotal role in child growth and development.

Details:

- **India**, with **6.7 million 'zero-food' children**, leads the **count**, constituting **nearly half of the surveyed group's total.**
- This is despite the crucial need for solid or semisolid foods alongside breastfeeding to meet the nutritional requirements during early childhood, crucial for growth and development.
- **India ranks third highest globally**, with **19.3% of children not receiving food**, following **Guinea (21.8%)** and **Mali (20.5%).**
- **Nigeria** and **Pakistan** also report **significant numbers of 'zero-food' children**, stressing the urgent need for targeted nutritional interventions in these regions.

Study findings:

- The study analysed data from **demographic and health surveys (DHS)** and **multiple indicator cluster surveys (MICS)** covering **276,379 children** across **92 LMICs**. The analysis focused on **feeding practices**, excluding **breastfeeding and liquid feedings outside of a sensitivity analysis.**
- **13.9 million children (10.4% of the sample)** had **not consumed any food in the last 24 hours.**
- **South Asia** and **West and Central Africa** reported the **highest prevalence** of 'zero-food' instances.
- Over **99% of 'zero-food' children** had been breastfed during the same period, indicating they received some form of nutrition.
- **Latin America** and the **Caribbean**, and **East Asia** and the **Pacific**, showed the **lowest prevalence of 'zero-food' children.**

Implications:

- The study underscores the significant impact of **adequate feeding on reducing mortality**, and **malnutrition**, and **improving brain development and school readiness.**

Government initiatives to curb malnutrition in India:

- **Integrated Child Development Services (ICDS) Scheme:** It was launched in **1975** and the program **aims to provide food, preschool education, primary healthcare, immunization, health checkups, and referral services to children under 6 years old and their mothers.**
- **Pradhan Mantri Matru Vandana Yojana (PMMVY):** It is a **Centrally Sponsored DBT scheme** with a **cash incentive of ₹ 5000/-** (in three instalments) being provided directly in the bank/post office account of **Pregnant Women and Lactating Mothers.**
- **National Nutrition Mission (NNM):** The government of India has launched the National Nutrition Mission (NNM), also known as **POSHAN Abhiyaan**, to eradicate malnutrition by the year **2022.**
- **Anaemia Mukh Bharat Abhiyan:** The mission was launched in 2018 to accelerate anaemia decline by one to three percentage points annually.
- **Mid-day Meal (MDM) scheme:** It aims to improve nutrition levels among school children in addition to increasing enrolment, retention, and attendance.
- **National Food Security Act (NFSA), 2013:** NFSA Assuring food and nutrition security for the most vulnerable is the aim of this law, which makes access to food a legal entitlement.
- **National Nutrition Strategy by NITI Aayog:**
 - The nutrition strategy envisages a framework wherein **4 proximate determinants of nutrition – uptake of health services, food, drinking water and sanitation and income and livelihoods** work together to accelerate the decline of **malnutrition** in India.
 - The Strategy envisages a **Kuposhan Mukh Bharat** – linked to **Swachh Bharat and Swasth Bharat.** Focus on **behavioural change.**
 - The **aim** is to ensure that States create customized State/ District Action Plans to address local needs and challenges with a greater role for panchayats and urban local bodies.

Railways plans to develop multi-modal transport hubs

Section: Infra

Context:

- The **Indian Railways** is embarking on a **project to develop mega railway terminals with multi-modal connectivity** in cities with populations exceeding 10 lakh, as part of the '**Viksit Bharat**' initiative led by Prime Minister Narendra Modi.

Details:

- This ambitious project aims to **enhance infrastructure** in aspirational cities and may also **extend to emerging cities** expected to see significant population growth.
- The **Ministry of Railways** is focusing on **improving passenger experiences, emphasizing the importance of cleanliness and maintenance of railway premises and trains**, particularly in the wake of expanding the **Vande Bharat Expresses network**.
- These efforts are part of a **broader mission to elevate the quality of travel and ensure a high standard of service**, with a stern warning against any negligence from senior officers.
- Furthermore, the **Railway Board** has addressed the need for thorough investigations and remedial actions in response to incidents affecting the operation of passenger and freight trains, such as brake binding and train parting.

“Viksit Bharat”@2047:

- The '**Viksit Bharat 2047**' agenda is a comprehensive vision plan by the **Government of India, aiming to transform India into a developed nation by the year 2047**, marking the **100th anniversary of its independence**.
- The vision encompasses various aspects of development, including **economic growth, social progress, environmental sustainability, and good governance**.
- The soul of Indian Version of notion of development is emphasised through Hon'ble PM's **Sankalp of Panch Pran**, with **Viksit Bharat** being one of them and of utmost importance.
- The **four pillars of Viksit Bharat** are **Yuva (Youth), Garib (Poor), Mahila (Women) and Kisan (Farmers)**.
- Other aspects like happiness ought to be the central pursuit in this journey. Without achieving happiness, development has no meaning. Ironically, the nations have developed, but people are not happy.

Current status:

- Presently, **India** is a **lower-middle income category**.
- To become a **high-income economy**, it needs to cross the barrier of **per capita GNI of \$13,846 by 2047**.
- To achieve the target, there is need to focus and work upon the **three major indicators of prosperity**:
 - Incremental increases in overall GDP and per capita incomes over specified long periods.
 - Changes in inequality of incomes in that country.
 - The rate of overall inflation and exchange rate changes in the currency of that country.

PM launches Pradhan Mantri Samajik Utthanevum Rozgar Adharit Jankalyan (PM-SURAJ) portal

Section: Vulnerable section

Context:

- The Ministry of Social Justice and Empowerment launched a nationwide initiative aimed at offering credit support to the marginalized segments of society

More on news:

- During the event, PM unveiled the '**Pradhan Mantri Samajik Utthan and Rozgar Adharit Jankalyan**' (**PM-SURAJ national portal online**) which symbolized the ministry's dedication in placing the underprivileged at the forefront, towards uplifting the most marginalized sections of society, and supported credit assistance to one lakh entrepreneurs hailing from disadvantaged communities.
- Prime Minister Shri Modi personally interacted with beneficiaries from various states who have been benefited under schemes like **NAMASTE, VCF-SC, VCF-BC, ASIIM from disadvantaged groups, that includes Scheduled Castes, backward classes, and Safai Mitras**.
- **Ayushman health cards and personal protective equipment (PPE) kits** were distributed by the ministry to sewer and **septic tank workers (Safai Mitras) under the National Action for Mechanized Sanitation Ecosystem (NAMASTE)**.
- **Credit support to 1 lakh entrepreneurs of disadvantaged sections** has been sanctioned under PM SURAJ scheme.

About NAMASTE scheme:

- **NAMASTE scheme to eradicate unsafe sewer and septic-tank cleaning practices** introduced by the **Ministry of Social Justice and Empowerment**.
- **Main features of the Scheme to be implemented in all ULBs are:-**
- **Identification:** NAMASTE envisages identifying the Sewer/Septic Tank Workers (SSWs).
- **Occupational Training and distribution** of PPE Kits to SSWs.
- **Assistance for Safety Devices** to Sanitation Response Units (SRUs).
- **Extending Health Insurance Scheme Benefits** to identified SSWs and their families under the Ayushman Bharat- Pradhan Mantri Jan Arogya Yojana (AB-PMJAY).
- **Livelihood Assistance:** The Action Plan will promote mechanization and enterprise development by providing funding support and subsidy (capital +interest) to the sanitation workers, to procure sanitation related equipment.
- **IEC Campaign:** Massive campaigns would be undertaken jointly by the ULBs & NSKFDC to spread awareness about the interventions of NAMASTE.

Certification of Railway Stations as Eat Right Stations by FSSAI

Objective:

- The Food Safety and Standards Authority of India (FSSAI) has certified **nearly 150 railway stations across India as Eat Right Stations**.
- This initiative is part of the **Eat Right movement, aiming to ensure safe, hygienic, and nutritious food options in various settings**.

Significance:

- Marks a significant milestone in advancing the Eat Right India movement.
- **Provides safe, hygienic, and nutritious food choices** for millions of passengers across India's extensive railway network.

Accredited Stations:

- **Railway Stations:** New Delhi, Varanasi, Kolkata, Ujjain, Ayodhya Cantt, Hyderabad, Chandigarh, Kozhikode, Guwahati, Visakhapatnam, Bhubaneswar, Vadodra, Mysuru City, Bhopal, Anand Vihar Terminal (Delhi), and Puratchi Thalaivar Dr MG Ramachandran Central Railway Station (Chennai).
- **Metro Stations:** Noida Sector 51, Esplanade (Kolkata), IIT Kanpur, Botanical Garden (Noida), and Noida Electronic City Metro Station.

Achieving Food Safety:

- Certification signifies **adherence to food safety standards, promoting healthier food choices**.
- Enhances the **overall dining experience for passengers** and commuters.

Public Health Impact:

- Promotes public health by offering food options that meet safety and nutritional standards.
- Encourages a **culture of healthy eating and well-being among travelers and commuters**.

Eat Right Station' certification

The 'Eat Right Station' certification awarded by the Food Safety and Standards Authority of India (FSSAI) signifies railway stations that excel in providing safe and wholesome food options to passengers.

- **Certification Purpose:** Recognizes railway stations that **maintain high standards of food safety** and hygiene for passengers.
- **Certification Process:**
 - Conducted by an FSSAI-empanelled third-party audit agency.
 - Stations are rated on a scale from 1 to 5 based on food safety, hygiene, and quality.
 - Upon conclusion of the audit, **stations meeting the benchmarks receive the 'Eat Right Station' certificate**.
 - Examples include **Anand Vihar Terminal Railway Station (Delhi), Chhatrapati Shivaji Terminus (Mumbai), Mumbai Central Railway Station (Mumbai), Vadodara Railway Station, and Chandigarh Railway Station**.

What is the 'Eat Right Movement'?

- **Initiative:** Led by FSSAI to revamp India's food system for safe, healthy, and sustainable food practices.

- **Tagline:** 'Sahi Bhojan, Behtar Jeevan' (Right Food, Better Life).
- **Alignment:** Aligned with National Health Policy 2017, focusing on **preventive healthcare and key programs like Ayushman Bharat, POSHAN Abhiyaan, Anaemia Mukh Bharat, and Swachh Bharat Mission.**
- **Approach:**
 - Regulatory measures.
 - Capacity building initiatives.
 - Collaborations for effective food safety.
 - Empowerment programs for informed choices.

About FSSAI:

- **Autonomous Body:**
 - Operates under the **Ministry of Health and Family Welfare, Government of India.**
- **Establishment:**
 - Formed **under the Food Safety and Standards Act, 2006, replacing previous food-related regulations.**
- **Objective:**
 - Sets science-based standards for food articles.
 - Regulates food manufacture, storage, distribution, sale, and import to ensure safe consumption.

The 'Eat Right Station' certification and the broader 'Eat Right Movement' by FSSAI are pivotal in promoting safe, healthy, and sustainable food practices across India's railway stations and beyond.

India's Stance on E-Comm Moratorium at WTO

India has emphasized the **need for a "re-examination" of the implications of the moratorium on customs duties on electronic transmissions**, especially concerning developing countries and the Least Developed Countries (LDCs).

This discussion took place at the **working session on the work program on e-commerce during the 13th WTO Ministerial Conference (MC13) in Abu Dhabi.**

Background:

- The **moratorium on customs duties on electronic transmissions** was decided by WTO members in 1998.
- This moratorium has been **periodically extended at successive ministerial conferences.**
- The **current discussion revolves around whether to extend this moratorium**

India's Position:

- **Revenue Loss Concerns:**
 - India has expressed concerns about the **substantial revenue loss that developing nations face due to this moratorium.**
 - There has been **no consensus on the scope of coverage** of the moratorium.
- **Technological Advancements:**
 - India highlighted the ongoing digital revolution and the emergence of technologies like additive manufacturing, 3D printing, data analytics, artificial intelligence, and the Internet of Things.
 - There is a **need to re-examine the implications of the moratorium in light of these technological advancements.**

Scope of Moratorium:

- India and South Africa pointed out that **if the moratorium's scope includes "transmission" only, it might be feasible to impose duties on content.**
- However, if the **scope extends to digitized and digitizable goods**, it could have significant implications.
 - A joint submission mentioned items such as **cinematograph films, books, newspapers, video games, computer software, and more.**
 - The list could **expand further as the digital economy evolves.**

Revenue Impact:

- According to a 2017 study by UNCTAD, **developing countries face an estimated annual revenue loss of \$10 billion due to the moratorium.**
- For India, the **estimated loss could be over \$500 million annually** (based on 2017 figures).

Global Perspectives:

- Developed countries such as the **US, Australia, the EU, and Japan** are advocating for an extension of the moratorium.

India's Suggestions:

- India emphasized the **need for developing countries to enhance their domestic physical and digital infrastructure.**
- Creating supportive policy frameworks and regulatory environments is crucial.
- **Developing digital capabilities is also essential for participating in the evolving digital economy.**

India's stance **reflects its concerns about revenue losses for developing nations, the evolving digital landscape, and the need for a comprehensive re-examination** of the moratorium's implications.

Department of Consumer Affairs conducts Stakeholders Meeting on Right to Repair Portal India

Context:

- The Hon'ble Prime Minister envisioned the **Mission LiFE (Lifestyle for the Environment)** for replacing 'use-and-dispose' economy — with a 'circular economy' promoting 'mindful and deliberate utilization' in place of mindless and wasteful consumption.

More on news:

- **Circular Economy also incorporates R3 concept i.e. Reduce, Reuse (repair) and Recycle.**
- **The Department of Consumer Affairs (DoCA)** has taken a significant step through the launch of the Right to Repair Portal India (<https://righttorepairindia.gov.in/>) on the occasion of National Consumer Rights Day 2022.
- The portal provides consumers to avail repair associated information for their **products and reduce e-waste.**
- Stakeholders were called on the basis of grievances registered at the National Consumer Helpline.

Right to Repair Portal:

- Right to Repair Portal India encompasses to facilitate and works as a catalyst for providing relevant repair associated information between the companies and consumers.
- The information includes:
 - Access to product manuals/ repair videos (by linking the websites and YouTube channels of the companies);
 - Address the concern on the price and warranty of spare parts;
 - Explicit mention on differences in liability covered guarantee, warranty and extended warranty;
 - Details of Companies Service Centre across India and Recognition third-parties repairers, if any, by the companies and
 - Information on country of origin to be explicitly mentioned.

Science and tech

Undersea cable disruptions expose India's crucial telecom vulnerability

Section: Awareness in IT

Context:

- **Three critical undersea cables, namely Asia-Africa-Europe-1, Europe India Gateway, and Tata Global Network, which connect India to the global telecom networks, have suffered damages which are speculated to be the result of targeted attacks amidst the ongoing conflict in the Red Sea region.**

Submarine Communication Cable:

- These are **strategically placed on the ocean floor, connecting land-based stations to facilitate the transmission of telecommunication signals** across vast bodies of water.
- Utilizing **fibre-optic technology**, these cables contain optical fibres that are encased in protective materials designed to withstand the harsh conditions of the marine environment.
- Offering a dependable, cost-effective, and high-capacity solution for internet connectivity, submarine cables present significant advantages over satellite alternatives.

India's undersea cable network:

- **India** boasts a **robust submarine cable network, with 17 cables** making landfall at **14 different cable landing stations**, predominantly in **Mumbai and Chennai**, as part of its ongoing efforts to **bolster undersea connectivity.**

- To **streamline and improve data transmission** while decreasing dependency on **international service providers**, the **Telecom Regulatory Authority of India (TRAI)** has implemented new regulations.
- These classify **Cable Landing Stations (CLS)** into **two categories: Main CLS and CLS Point of Presence**, aimed at enhancing data flow.
- Further, **TRAI** has put forth recommendations to acknowledge the operations of submarine cables as essential services. It has suggested changes to legislation and proposed tax exemptions for critical equipment, including exemptions from customs duty and GST.
- **Notable submarine cable projects include:**
 - **The MIST Submarine Cable System** establishes links between India and countries like **Myanmar, Thailand, Malaysia, and Singapore**.
 - **Reliance Jio Infocomm's India Asia Xpress (IAX)** creates direct connections from India to the **Maldives, Singapore, Sri Lanka, and Thailand**.
 - **The India Europe Xpress (IEX)** spans from India to Italy through **Saudi Arabia and Greece**.
 - **The SeaMeWe-6 project** connects Singapore to France with stops in India, **Bangladesh, and the Maldives**.
 - **The Africa2 Cable** links India to the **UK** through various **African nations**.

Telecom Regulatory Authority of India (TRAI):

- **TRAI** is a **regulatory body** set up by the **Government of India** under **section 3** of the **Telecom Regulatory Authority of India Act, 1997**.
- It is the **regulator of the telecommunications sector in India**.
- It consists of a **chairperson** and **not more than two full-time members** and **not more than two part-time members**.
- The **TRAI Act** was amended by an **ordinance**, effective from **24 January 2000**, establishing a **Telecom Disputes Settlement and Appellate Tribunal** to take over the **adjudicatory and dispute functions** from **TRAI**.

Tired of spam or fraud calls? File a complaint on

Section: Awareness in IT

Chakshu platform:

- The **Department of Telecommunications (DoT)** has introduced **Chakshu**, an **online platform for telecom users to report suspected fraud or spam callers**, accessible via **sancharsaathi.gov.in/sfc**.

Details:

- This **initiative aims** to empower citizens to **report fraudulent communications related to various services** such as **bank accounts, payment wallets, SIM and utility connections, KYC updates, impersonation, and sextortion**.
- Alongside, the **DoT** launched the **Digital Intelligence Platform**, a **secure data-sharing tool for stakeholders** like **Telecom Service Providers, law enforcement, financial institutions, and social media platforms**, among others, to **combat fraud**.
- Furthermore, Communications Minister Ashwini Vaishnaw endorsed the **Caller Name Presentation (CNAP) feature**, which would **allow users to see the registered name of incoming callers**, despite concerns over **privacy implications**.
- The minister emphasized the **importance of informed consent** and mentioned that **recommendations for CNAP** by the **Telecom Regulatory Authority of India** would undergo thorough review before implementation.

What's Chakshu Portal?

The **Chakshu portal**, part of the **Sanchar Saathi initiative**, allows citizens to report suspected fraud communications aimed at defrauding telecom service users. Examples include fraudulent communication related to bank accounts, payment wallets, SIM cards, and impersonation as government officials or relatives.

How to Use Chakshu Portal to Report Spam Calls, fraud

1. Log in to the '**Sanchar Saathi**' portal at **sancharsaathi.gov.in**
2. Select the '**Chakshu**' option under '**Citizen Centric Services**.'
3. Review the disclaimer and the uses of '**Chakshu**,' then click '**continue for reporting**.'
4. Fill out the form with details such as the medium, category, and timing of the suspected fraud communication.
5. Add personal details, verify with OTP, and submit the complaint.

Chakshu Portal: What you can report on Sanchar Saathi Portal

- Check mobile connections issued in their name and report unnecessary or unauthorized connections.
- Report stolen/lost mobile handsets for blocking and tracing.

- Verify the authenticity of mobile handsets when purchasing new or used devices.
- Report incoming international calls displaying Indian telephone numbers as caller ID.
- Check details of licensed wireline Internet Service Providers.

Furthermore, the Department of Telecom has introduced the DIP, which will facilitate the sharing of information with law enforcement agencies, banks, and other financial institutions to combat fraud. The combined efforts of Chakshu and the Digital Intelligence Platform are expected to bolster the detection and prevention of cyber fraud.

AI has a big and growing carbon footprint, but algorithms can help

Section: Awareness in IT and Computers

Context:

- **Artificial intelligence (AI)** offers immense potential for **solving complex problems**, including the **climate crisis**. Yet, its **significant energy consumption for operating large-scale data centres** places it both as a **contributor** to and a **potential solver** of climate issues.

Details:

- The **carbon footprint of AI** mainly stems from the **extensive data processing** during its **training and inference phases**, with **training phases**, in particular, being **extremely energy and resource-intensive**.
 - Training **GPT-3** (the precursor AI system to the current **ChatGPT**) generated **502 metric tonnes of carbon**, which is **equivalent to driving 112 petrol powered cars for a year**. **GPT-3** further emits **8.4 tonnes of CO₂ annually** due to **inference**.
- **Technological advancements**, such as **spiking neural networks** and **lifelong learning**, offer avenues for **reducing the carbon footprint of AI systems** by **optimizing their efficiency**.
- The **growth of AI's energy demands**, having **increased by a factor of 300,000** since the early **2010s**, underscores the urgency for developing more **sustainable AI technologies**.
- Without standard, accurate methods to measure **AI-related emissions**, current estimates of **AI's environmental impact** might even be underrepresented, suggesting the need for more rigorous evaluations and innovations to align AI development with climate sustainability goals.

Spiking neural networks (SNN):

- **SNNs and Lifelong Learning (L2)** are **emerging technologies** with the potential to significantly **reduce the carbon footprint of Artificial Intelligence (AI)**.
- **SNNs**, in particular, offer an **energy-efficient alternative** to **traditional Artificial Neural Networks (ANNs)**.
- **ANNs** require **substantial computing power, memory, and time** due to their **reliance on decimal numbers** and **precise calculations**, becoming **more energy-intensive** as they grow in complexity.
- In contrast, **SNNs**, like the **human brain**, **operate on intermittent electrical signals** or **spikes**, which **convey information** through the **timing of these spikes** rather than **continuous activity**.
- This **binary, all-or-none mechanism** allows **SNNs** to be up to **280 times more energy-efficient than ANNs**, consuming energy only during a spike and requiring minimal energy otherwise.
- Researchers are developing **learning algorithms for SNNs** to further enhance their **energy efficiency**, potentially enabling them to operate closer to the **brain's efficiency levels**.
- The reduced computational needs of **SNNs** may also allow for **quicker decision-making processes**.
- Given their **energy efficiency**, **SNNs** are considered particularly suitable for applications where **energy resources are limited**, such as **space exploration, defense, and self-driving cars**.

Lifelong Learning:

- **Lifelong Learning (L2)** is a technique **aimed at reducing the energy consumption of Artificial Neural Networks (ANNs)** throughout their operational life.
- Traditionally, **ANNs** tend to **forget previously learned information** upon training for new tasks, necessitating retraining from scratch with each change in their operational environment. This process significantly contributes to **AI-related carbon emissions**.
- **L2** addresses this issue by employing a set of algorithms that allow AI models to sequentially learn and retain knowledge across multiple tasks, **minimizing or eliminating the need for retraining from scratch**.
- This approach not only reduces energy requirements but also enhances the models' ability to accumulate knowledge over time.

- Beyond **L2**, the **AI** field is exploring additional strategies to **decrease energy demands**, such as **developing smaller AI models** that maintain predictive accuracy comparable to larger counterparts.
- Furthermore, **advancements in quantum computing** are anticipated to revolutionize the training and inference processes for both **ANNs** and **SNNs**.
- By leveraging quantum physics phenomena, **quantum computing** could offer **unprecedented computational speed and efficiency**, potentially enabling the **creation of more energy-efficient AI solutions on a larger scale**.
- Addressing the **energy demands of AI is critical** in the context of **climate change**, underscoring the urgency of finding sustainable advancements in this rapidly evolving technology area.

Why ASML's new chip-making machine is a scientific marvel

Section: Awareness in IT & Computer

Semiconductor lithography:

- Computers operate by encoding data into **bits**, represented by **0s** and **1s**, through **semiconductors**. These **small devices store data and execute calculations**, enabling **computing functions**.
- The widespread availability of powerful computers is largely due to **semiconductor lithography**, a technique for **crafting detailed circuits with high precision**.
- This process is **automated** by **highly expensive machines**, costing between **Rs 800 crore** and **Rs 1,600 crore**.

High NA EUV machine:

- **ASML**, a company based in the **Netherlands**, has a **monopoly** in this field, producing these machines for a market valued at **\$125 billion**, making it **Europe's most valuable tech company**.
- In February, **ASML** introduced its "**High NA EUV**" machine, priced at **\$350 million** each and comparable in size to a **double-decker bus**.
- This machine, utilizing **extreme ultraviolet (EUV) photolithography**, represents a **leap in semiconductor manufacturing technology**. It enables the **creation of semiconductors by transferring the circuit design of a transistor onto a silicon wafer coated with a light-sensitive substance**.
- Exposing this to **light solidifies the design**, allowing for the addition of wiring to complete the transistor. This innovation puts **ASML** in **direct competition with Intel** in the race to supply **advanced semiconductors for future computers and smartphones**.

What is the Rayleigh scattering criterion?

- The **Rayleigh scattering criterion** is a principle in physics that **dictates the minimum feature size** that can be **accurately imprinted onto a silicon wafer** during the **semiconductor manufacturing process**.
- This **criterion** establishes that the **size of the feature is directly proportional to the wavelength of the light used and inversely proportional to the lens aperture that directs the light onto the wafer**.
- The **proportionality to the wavelength** includes a variable factor '**k**', which can reach up to **0.25** and is influenced by factors such as the **operating temperature** and the **chemical properties of the photoresist used**.
- The aperture represents the capacity to collect and focus light on the wafer, meaning a larger aperture allows for smaller features.
- To achieve finer details on **wafers**, engineers have historically focused on **utilizing light with shorter wavelengths**. For instance, chip manufacturers transitioned from using light with a wavelength of **436 nanometers (nm)** about forty years ago to employing **extreme-ultraviolet (EUV) light** with a **wavelength of 13.5 nm** in **modern equipment**. Before the adoption of EUV technology, the industry utilized **deep ultraviolet (UV) light** with a **193 nm wavelength** to etch complex patterns onto wafers.

How is EUV light produced?

- The production of **extreme ultraviolet (EUV) light**, critical for **manufacturing advanced semiconductor chips**, involves a **highly sophisticated process**. To fabricate smaller and more powerful chips by cramming more transistors onto them, the **semiconductor industry**, including **ASML**, employs a method to generate **13.5-nm wavelength light**.
- This method starts with propelling a **50-micrometer-wide droplet of liquid tin** through the machine at a **speed of nearly 300 km/hr**.
- A laser then **strikes the droplet**, flattening it into a pancake shape. While still in **motion**, a second, more **intense laser beam** hits the **tin**, ionizing it into a **high-temperature gas, 40 times hotter than the Sun's surface**, which emits the desired **EUV light**.

- This complex process, occurring **50,000 times per second**, requires shooting **50,000 tin droplets** and applying **twice** as many **laser pulses to generate EUV light** of adequate intensity for **semiconductor lithography**. Moreover, the entire operation is conducted in a **vacuum** to prevent absorption by air or any other substances, which could reduce the efficiency of **EUV light production**.

Precision and value of machine:

- The precision of the machine is **extraordinarily high**. The **mirrors**, produced by **Zeiss**, are the **smoothest surfaces ever made**, with imperfections so minor that, when scaled, the **largest deviation** would be just **1 mm high** if the **mirror's surface** were as large as **Uttar Pradesh**.
- To **maintain this precision in directing light to the silicon wafer**, the **wafer stage floats on a magnetic field to eliminate friction** and is adjusted with extreme accuracy—up to **50 picometers—20,000 times per second**.
- This level of adjustment is critical for achieving the **minuscule feature sizes** required on **modern chips**, and the machine accomplishes this with an acceleration surpassing that of F1 cars or fighter jets.
- The "**High NA EUV**" **machine** represents a **series of technological achievements** that significantly advance the field of computing, playing a crucial role in the development of future technologies such as **AI, robotics, intelligent vehicles, high-quality digital communication, and space exploration**.
- **Semiconductor chips**, which these machines help create, are central to powering these innovations by performing the vast number of calculations they require.
- The **continuous miniaturization and enhancement of these chips**, in line with **Moore's law**, have progressed from the **first integrated circuit** with just **four transistors to modern chips** with over **19 billion**.
- Additionally, these **lithography machines** have strategic importance, exemplified by **ASML's restrictions on selling its advanced machines to certain countries**, highlighting the **geopolitical implications of semiconductor technology**.
- These machines not only drive technological progress but also **create high-skilled jobs and bolster national technological sovereignty**.

Why Anthropic calls the new Claude 3 its 'most intelligent' AI model yet

Section: Awareness in IT & Computer

Context:

- Anthropic was founded by former members of OpenAI, the company behind ChatGPT. It says its new family of AI models is capable of advanced performance, beating the likes of GPT-4 on some parameters.

More on news:

- The family includes three state-of-the-art AI models in the ascending order of capabilities – **Claude 3 Haiku, Claude 3 Sonnet, and Claude 3 Opus**.
- The company claims that each model offers an increasingly powerful performance, **offering a balance** between intelligence, speed, and cost based on their specific use case.

What is Claude 3?

- **Claude is a group of large language models (LLMs) developed by Anthropic**.
- The chatbot is capable of handling text, voice messages, and documents.
- The chatbot is capable of generating **faster, contextual responses compared to its peers**.
- Claude 3 Opus is the most powerful model, Claude 3 Sonnet is the middle model that is capable and price competitive, and Claude 3 Haiku is relevant for any use case that requires instant responses.
- Claude Sonnet powers the **Claude.ai chatbot for free** at present and users only need an email sign-in.
- **Opus is only available through Anthropic's web** chat interface and if a user is subscribed to the Claude Pro service on the Anthropic website. It is available for \$20 a month.
- All new models come with a 2,00,000-token window, signifying possibly better performance, accuracy and the capacity to input more information in a user prompt.

How did Claude 3 perform?

- Based on the comparison of Claude 3 with its peers, it seems the Anthropic may have caught up with OpenAI.
- It had surpassed many AI models with the launch of its GPT-4 Turbo.
- Claude 3 reportedly demonstrates advanced performance across cognitive tasks such as reasoning, expert knowledge, mathematics, and language fluency.

- Despite the lack of consensus over whether LLMs can really “know” or “reason,” the AI research community commonly uses these terms.
- The company says that the Opus model exhibits “near-human levels of comprehension and fluency on complex tasks”.
- While this is a big claim, the scores show that Claude 3 Opus has shown some near-human performance on specific benchmarks. However, this doesn’t mean that Opus possesses general intelligence like humans.

Claude 3 vs GPT-4

- **Claude 3 Opus has surpassed GPT-4** on as many as 10 AI benchmarks, which include MMLU (undergraduate level knowledge), HumanEval (Coding), HellaSwag (common knowledge), and GSM8K (grade school math).
- On the benchmark scores, **Claude 3 beats its peers narrowly. For example, in the five-shot MMLU trial, Claude 3 secured 86.8 percent while GPT-4 obtained 86.4 percent.**

Benchmark scores.

- Claude 3 has also shown improvements in terms of analysis, forecasting, content creation, multilingual conversations, code generation, etc.
- Anthropic claimed that the new model family also comes with enhanced vision capabilities, allowing Claude 3 to process photos, charts, and diagrams, much like GPT-4V.

Limitations of Claude 3

- According to those who had early access to the model, Claude 3 performs well in tasks such as answering factual questions and optical character recognition (OCR), meaning the ability to extract text from images.
- However, **it struggles with complex reasoning and mathematical problems at times.**
- It also exhibited biases in its responses, such as favoring a certain racial group over others.
- In the past too, other AI models have faced similar problems.
- **Google’s AI chatbot Gemini was criticized** after it showed racial bias and historical inaccuracies. It refused to generate images of white individuals and depicted those individuals as people of color.
- **Anthropic has emphasized the safety features of Claude 3, especially its refusal to generate** harmful or illegal content.
- The company was also among the first to bring about Constitutional AI. Developers laid down a set of values that the system must follow so that it undertakes politically and socially responsible actions.
- As of now the Claude 3 is the most expensive model on the market, but Anthropic has plans to release affordable versions soon.
- Based on the early reports, benchmarks, and confidence from the AI community, Claude 3 seems to be a significant step forward in the development of LLMs.

AI knowledge consortium formed by 12 organisations

Section: Awareness in IT

About AI Knowledge Consortium (AIKC):

- **AIKC, a coalition of twelve research institutions and think tanks**, has been formed in **India to promote a multi-stakeholder approach to AI governance.**
- This initiative underscores the importance of **responsible business practices and societal oversight in integrating AI into daily life.**
- The **AIKC's operations** will be coordinated by **Koan Advisory**, a consultancy specializing in assisting foreign businesses with entering the Indian market.
- A report titled **“What Indian Parliamentarians Think of AI,”** which reflects the **views of 37 MPs on AI regulation and innovation**, was released alongside the announcement.
- **Key members of the AIKC** include **Aapti Institute, Cyber Saathi, Communeeti, Esya Centre, the Institute for Governance, Policies and Politics**, and the **New Indian Consumer Initiative.**

Mission:

- To elevate AI governance in India, ensuring that the technological revolution triggered by it is inclusive, equitable, and reflective of our shared values and aspirations.
- AIKC collaborate to navigate the challenges and opportunities of AI, towards shaping a resilient future, one which is just, and abundant with possibilities for all.

Foundational Pillars:

- We are guided by **four pillars** that embody our collective aspirations and principles. These serve as the bedrock of our collaboration, weaving together our diverse membership and expertise.
- Together, these pillars frame our collective endeavour, ensuring that our approach is reflective, responsive, and resonant with our values.

Pillar 1: Community Empowerment

Pillar 2: Knowledge Stewardship and Research

Pillar 3: Capacity Building

Pillar 4: Inclusive Dialogue and Outreach

As Big Tech scrambles to meet EU rules, investigations seen as likely

Section: Awareness in IT

Context:

- The world's largest tech companies, including **Google, Apple, Amazon, Microsoft, Meta, and ByteDance**, have updated their core platform services to comply with the **European Union's Digital Markets Act (DMA)**, aiming to ensure fair competition.
- However, there's scepticism about the **adequacy of these efforts**, with **potential investigations looming due to possible non-compliance**.

About Digital Marketing Act (DMA):

- The DMA represents a **significant regulatory move to control the influence of "Big Tech,"** threatening fines of up to **10% of global turnover for non-compliance**.
- **Apple** is notably impacted by the DMA, required to allow alternative app distribution channels outside its App Store in the EU.
- However, its introduction of a **"core technology fee"** has **raised concerns among EU antitrust authorities** for potentially discouraging businesses from switching to competitors.
- The **EU aims for swift enforcement of the DMA**, contrasting with the typically lengthy antitrust investigations, indicating a rigorous approach to regulating Big Tech's market practices.

Which companies have to follow the rules?

- **DMA targets 22 services** spanning **operating systems, messenger apps, and social media platforms**, aiming to regulate the largest tech companies.
- **Services under scrutiny** include **Google's Maps, YouTube, Chrome browser, and Android OS; Amazon's Marketplace; Apple's Safari browser and iOS; Meta's Facebook, Instagram, and WhatsApp; and Microsoft's Windows and LinkedIn.**

WHAT EFFECT WILL THE RULES HAVE GLOBALLY?

- **DMA** signifies a crucial development by the **European Union** in its role as a **global leader in regulating the tech industry**.
- The **EU** has a history of imposing significant fines on **Google for antitrust violations, establishing stringent social media regulations, and introducing pioneering artificial intelligence legislation**.
- Now, countries such as **Japan, Britain, Mexico, South Korea, Australia, Brazil, and India** are creating their **DMA-like rules** to prevent tech giants from monopolizing digital markets.

HOW WILL DOWNLOADING APPS CHANGE?

- **Apple** has announced it will **allow European iPhone users to download apps from sources outside its App Store**, a significant shift from its previous policy.
- This change is in response to the **Digital Markets Act (DMA)** requirements but comes with a **caution from Apple** about the **potential security risks of "sideloading" apps**.
- Despite reducing the **fees for app developers** who choose to use Apple's payment-processing system in **Europe**, **Apple** is introducing a **50-euro cent fee for each iOS app installed via third-party app stores**.
- Critics argue this could discourage developers of free apps from using alternative app stores, as they would now face a per-user fee, potentially limiting the diversity and appeal of these stores.

HOW WILL PEOPLE GET MORE OPTIONS ONLINE?

- Under the **Digital Markets Act (DMA)**, consumers will **gain more autonomy over their digital choices**, and no longer be bound to **default options for essential services**.

- **Android users** will have the **freedom to select their preferred search engine**, while **iPhone users can choose their default browser**.
- These changes **aim to dismantle the automatic preference for services like Apple's Safari or Google's Search**, with **European users** encountering choice screens on their devices to facilitate this. Additionally, Microsoft will no longer compel users to adopt its **Edge browser**.
- However, **concerns persist among smaller service providers** that these measures may not significantly **alter consumer behaviour**.

HOW WILL INTERNET SEARCHES CHANGE?

- **Google will modify how some search results are displayed, eliminating the preferential treatment for its own services.**
 - For instance, hotel searches will feature an additional carousel for booking sites like Expedia, while Google Flights will no longer have a dedicated button and will be included among the standard blue link search results. This change **aims to foster a fairer competitive environment online**.
- Furthermore, the **DMA empowers users to have more control over their privacy**, particularly concerning targeted advertising. Google will offer users the **option to prevent their data from being utilized across its various services for ad-targeting purposes**.
- Similarly, **Meta** is introducing measures to **allow users to keep their Facebook and Instagram data separate**, preventing the amalgamation of personal information for advertising.
- Another **significant change** introduced by the **DMA** is the **requirement for interoperability among messaging systems**.
 - This means **companies must ensure their messaging apps can communicate with one another**.
 - Specifically, **Meta**, owning the **only two chat apps covered by these rules**, is expected to devise a plan enabling **Facebook Messenger and WhatsApp users to exchange text messages, videos, and images seamlessly**, further **enhancing user choice and flexibility in digital communication platforms**.

Meet Pi, the world's 'friendliest' chatbot powered by the new Inflection-2.5 LLM

Section: Awareness in IT

Context:

- In less than a week, two Large Language Models (LLMs) have been launched that are closer to or even better at tasks than OpenAI's GPT-4.

More on news:

- After Anthropic's Claude 3 captured the attention of the AI community, Inflection AI launched its latest LLM, Inflection 2.5 which is an upgrade to its model that powers its friendly chatbot Pi personal assistant.
- Inflection AI, a California-based AI startup founded by former co-founders of DeepMind and LinkedIn, introduced Pi, their personal AI, in May 2023.

What is Inflection 2.5?

- **Inflection-2.5** is an upgraded in-house model that is competitive with all the **world's leading LLMs like GPT-4 and Gemini**.
- The company claims that the newly upgraded **LLM comes with its signature personality and uniquely empathetic fine-tuning**.
- The company claims that its latest model achieved **GPT-4's performance with only 40 per cent of the OpenAI model's computation power for training**.
- With the new upgrade, Pi has now been endowed with world-class real-time web search capabilities to ensure that users get access to high-quality and up-to-date information in real-time.

What is the Pi chatbot?

- Pi is an AI chatbot with which one can have deep and meaningful conversations.
- Pi was launched at a time when the world was marveling at **OpenAI's sensational ChatGPT**.
- While ChatGPT offered human-like responses, Pi came with a radically different vigour.
- Pi is more humane and has been promoted as a chatbot that has a personality.
- Inflection AI dubbed it as a chatbot that is **"supportive, smart, and there for you anytime"**.
- While ChatGPT and Gemini were mostly personal assistants that were useful at work, Pi is more like a companion to humans and is free to use.

- The chatbot comes with a voice, in six distinct voices, to choose from adding life to conversations.
- On the technical side, for training purposes, **the chatbot has been shown billions of lines of text on the open web.**
- Incidentally, the name **Pi stands for personal intelligence and it offers infinite knowledge according to a user's need.**
- Upon its launch, Pi was powered by **Inflection's proprietary LLM Inflection-1 which was trained on thousands of NVIDIA H100 GPUs on a very large data set.**
- Based on the evaluations, Inflection-1 was ranked the best model in its compute class outdoing the likes of GPT-3.5, LLaMA, and PaLM-540B on a wide range of benchmarks. In 2022, the company launched its new model Inflection-2, which was trained on 5,000 NVIDIA H100 GPUs.
- Inflection-2 outclassed Google's flagship LLM PaLM 2 on various benchmarks including MMLU (massive multitask language understanding), TriviaQA (a realistic text-based question-answering dataset), HellaSwag& GSM8k.

How is Inflection-2.5 different?

- With the upgraded **language model Inflection-2.5**, the company has enhanced the emotional quotient of the Pi chatbot.
- **Inflection-2.5 also outperforms its predecessor Inflection-1 on the MMLU benchmark and performs at the 85th percentile of human test-takers on the Physics GRE.**
- **Inflection-2.5 retains the Pi chatbot's unique persona along with maintaining extraordinary safety standards.**
- The model achieves this all the while making the chatbot a more **helpful model across the board.**

A (very) basic guide to artificial intelligence

Section: Awareness in IT

Context:

- 'Artificial intelligence' (AI) is **intelligence in a machine**. There is currently **no one definition of AI**. A simple place to begin is with **AI's materiality**, as a **machine-software combination**.

What does the machine do?

- **Linear separability** is a **fundamental concept** in **AI**, illustrating how machines can **distinguish** between **different categories of data**. This concept is exemplified through the task of separating cat and dog images, a process that, while not typically assigned to linear classifiers, serves to clarify the principle involved.
- Through this process, the machine attempts to find a pattern or a line (in the case of a 2D graph) or a plane (in a 3D space) that effectively separates the images into two groups, one predominantly consisting of cat images and the other of dog images. Once a satisfactory separation is achieved, demonstrating that the machine has successfully classified the images based on the given features, the experiment concludes.
- This scenario underscores the **machine's ability to distinguish between categories using linear separability**, a **core concept in AI and machine learning**, which involves finding a **linear boundary that divides data into distinct groups** based on their features.

How hard is decision-making?

- **Decision-making in AI** ranges from **simple** to **extremely complex**, based on the **dataset's nature** and the **decision's context**.
- **Simple Decision-Making:** In straightforward cases, such as separating a set of marbles based on a single characteristic, decision-making can be very reliable with just one parameter.
- **Intermediate Complexity:** For tasks like distinguishing between cats and dogs, AI may require a dozen parameters. These parameters could include various physical attributes, and AI tools might plot these features on graphs to classify the subjects effectively.
- **High Complexity:** Decision-making becomes significantly more complex in scenarios like a **driverless car deciding when to brake for a bird crossing its path**. Here, hundreds of parameters might be needed, including the context of the situation (e.g., the urgency of reaching a destination).
- **Mind-Boggling Complexity: Large Language Models (LLMs)** like **ChatGPT** represent an even more **advanced level of decision-making**. **ChatGPT doesn't classify information but generates text by predicting the next word in a sequence based on its training from a massive corpus of text**. This process involves understanding the creation process behind the text, reflecting the real world. **ChatGPT** operates with over **100 billion parameters**, showcasing its **high level of complexity in decision-making and text generation**.

Types of Machine Learning:

- **Supervised Learning:** Involves learning from labeled data, where the structure and categories of the data are defined.

- **Unsupervised Learning:** The machine learns to organize and interpret data without predefined labels or categories, identifying patterns and structures on its own.
- **Reinforcement Learning:** The machine learns through trial and error, adjusting its actions based on feedback to maximize a reward signal.

Artificial Neural Networks (ANNs):

- ANNs are computational models inspired by the human brain's network of neurons. They consist of nodes (or neurons) connected in a way that allows the network to learn and make decisions.
- **Components:**
 - **Activation Functions:** Algorithms that determine a node's output based on its input signals.
 - **Weights:** Values that represent the importance of each input to the node, influencing the output.

Transformers:

- A type of ANN that allows for parallel training, making it efficient for processing large datasets.
- **Components:**
 - **Encoder:** Breaks down input data (e.g., an image) into smaller pieces and encodes it as numerical data.
 - **Decoder:** Processes the encoded data to reconstruct or interpret the input data's content.
- **Significance:** Introduced in 2017 by Google, transformers have significantly improved the performance of ANNs in tasks like language translation by focusing attention on different parts of the input data.

GPUs and AI Development:

- A **Graphics Processing Unit** initially designed for rendering graphics in video games, is now widely used in running ANNs due to its ability to perform parallel computing tasks efficiently.
- **Nvidia's Role:** Nvidia has become a leading provider of GPUs for AI and machine learning, experiencing rapid growth in valuation due to the demand for AI technologies.
- **Market Challenges:**
 - Competition from companies developing non-GPU hardware.
 - Researchers creating smaller, less resource-intensive learning models.
 - Development of new software to reduce dependency on specific hardware, like Nvidia's GPUs.

Musk to 'open source' his Grok chatbot to tackle rival ChatGPT

Section: Awareness in IT and computers

Context:

- Elon Musk said he would make his **Grok chatbot**, a rival to ChatGPT, **open source** as his feud with OpenAI deepens.

About Grok chatbot:

- **Grok** is a **generative artificial intelligence chatbot** developed by **xAI**, based on a **large language model (LLM)**.
- The chatbot is advertised as "**having a sense of humor**" and direct access to Twitter (X).

What are large language models (LLMs)?

- **Large Language Models (LLMs)** are **advanced AI systems** designed to understand and **generate human-like language**.
- They use vast amounts of data to learn patterns and relationships in language, enabling them to answer questions, create text, translate languages, and perform various language tasks.

'Open source' chatbots:

- An **open-source chatbot** is **software** that has its **original code available to everyone**.
- Users can tweak this code depending on their needs and preferences.
- One can find these source codes on websites like GitHub and use them to build one's chatbots.

Meet Devin AI: the world's 'first fully autonomous' AI software engineer

Section: Awareness in IT and computer

Context:

- **US-based applied AI lab, Cognition**, has introduced what it claims is the world's first AI software engineer.

More on news:

- The makers say that the **AI agent, named Devin**, has passed practical engineering interviews held by leading AI companies.

- It has also completed real jobs posted on Upwork, an US-based freelancing platform, according to Cognition.
- **A first of its kind, Devin AI has the ability of taking a simple command and turning it into a functioning website or software program**, Cognition, backed by the Founders Fund.

What can Devin do?

- The AI agent comes with some advanced capabilities in software development, including coding, debugging, problem-solving, etc.
- **Devin uses machine learning algorithms** to constantly learn and improve its performance and adapt according to new challenges.
- Devin can build and deploy apps end-to-end and can also train and fine-tune its own AI models.
- Devin can plan and execute complex engineering tasks that would require thousands of decisions.
- The makers have also endowed the AI software engineer with the ability to proactively collaborate with the user. It reports progress in real-time, is capable of accepting feedback, and works along with the user through design choices as needed.

What about its performance?

- **On the SWE-Bench benchmark (a benchmark for evaluating large language models on real-world software issues found on GitHub)**, Devin correctly resolved 13.86 per cent of the issues without any assistance compared with the 1.96 per cent unassisted and 4.80 per cent assisted of the previous state-of-the-art model.
- In terms of performance, **Devin AI is capable of augmenting efficiency** and speed within software development processes by automating repetitive tasks, instantly generating code, expediting project timelines, and cutting down development expenses substantially.
- One of the most notable facets of Devin AI is that it is immune to human errors or inconsistencies.
- The AI agent is capable of **guaranteeing precision and uniformity** in coding practices which can lead to the development of superior-quality software products.

Why self-censorship of political speech could be the future normal for AI platforms

Section: Awareness in IT and computer

Context:

- As India heads to **Lok Sabha elections**, **Google has said it will restrict the types of election-related questions users can ask its artificial intelligence (AI) chatbot Gemini** in the country.

More on news:

- Earlier, **Krutrim, the chatbot developed by an Indian AI startup founded by Bhavish Aggarwal of Ola, had been found to self-censor on certain keywords.**
- Ola had seemingly applied **algorithmic filters** to ensure that Krutrim beta did not produce results for queries that included keywords such as Narendra Modi, BJP, and Rahul Gandhi.
- AI platforms such as India's own Krutrim while answering political questions, the government chose to instead advise the companies to fine-tune their systems.

What is "code-level censorship"?

- Basically these companies have **written a code that whenever a user asks a question that contains certain keywords, the platform will not ping the underlying foundational model, which has the potential answer to that question, but return with a predetermined response that it is not able to respond to that particular question.**

What is the specific background of Google's decision?

- Google's AI platform has been under fire in recent weeks over the various responses it has generated.
- The company apologized for what it said were "inaccuracies in some historical image generation depictions" after Gemini depicted white figures (such as the founding fathers of the United States) or groups like Nazi-era German soldiers as people of color.

What is SIMA, Google Deepmind's new AI that can play video games with you

Section: Awareness in IT and computer

Context:

- **Google DeepMind on March 13** revealed its latest AI gaming agent called SIMA or Scalable Instructable Multiworld Agent, which can follow natural language instructions to perform tasks across video game environments.

More on news:

- **SIMA points** to a future of gaming where AI agents could play a key role.
- It also takes us a step closer to AI which can intelligently collaborate with humans not only in games but also in **doing tasks in real-world environments**.
- With an AI robot to help seniors beat loneliness and a fully autonomous AI software engineer released recently, the week has been a busy one for AI enthusiasts.

What is SIMA?

- AI research lab Google Deepmind describes SIMA as an AI Agent, which is different from AI models such as **OpenAI's ChatGPT or Google Gemini**.
- AI models are trained on a vast data set and are limited when it comes to working on their own.
- On the other hand, an **AI Agent can process data and take action themselves**.
- **SIMA can be called a generalist AI Agent** that is capable of doing different kinds of tasks. It is like a virtual buddy who can understand and follow instructions in all sorts of virtual environments – from exploring mysterious dungeons to building lavish castles. It can accomplish tasks or solve challenges assigned to it.
- It is essentially a super-smart computer programme that can be thought of as a digital explorer, having the ability to understand what you want and help create it in the virtual world.

How does SIMA work?

- SIMA “understands” your commands as it has been trained to process human language. So when you ask it to build a castle or find the treasure chest, it understands exactly what these commands mean.
- One distinct feature of this AI Agent is that it is capable of learning and adapting.
- SIMA does this through the interactions it has with the user.
- The more you interact with SIMA, the smarter it gets by learning from its experiences and improves over time.
- Based on the **current stage of AI development**, it is a big feat for an AI system to be able to play even one game.
- This could potentially introduce more helpful AI agents for other environments.

How was SIMA trained?

- To expose the AI agent to different environments, Google Deepmind collaborated with eight game studios to test SIMA on nine different video games, including **Teardown by Tuxedo Labs and No Man's Sky by Hello Games**.
- With every game, **SIMA's portfolio opened a new interactive world along with a range of skills** for it to learn, such as simple navigation, menu use, mining resources, flying spaceships, etc.
- They also used four research environments, including one built with the cross-platform game engine Unity.
- This environment, called Construction Lab, required AI agents to build sculptures from building blocks.
- This exercise was done to test the agent's object manipulation abilities and intuitive understanding of the physical world.

Why the B200 Blackwell chip will consolidate Nvidia's stranglehold over the AI market

Section: Awareness in computer and IT

Nvidia's New AI Chip Announcement- B200 'Blackwell':

- Nvidia Corporation's CEO, **Jensen Huang**, announced the **new AI chip** at their **annual developer conference** in **San Jose, California**.
- The new chip, named **B200 'Blackwell'**, outperforms its predecessor, the **H100 'Hopper'**, by completing some computational tasks **30 times faster**.
- The **Blackwell GPU** contains **208 billion transistors**, significantly more than the **H100's 80 billion**, enhancing Nvidia's GPU offerings.
- **Performance Enhancements:**
 - The **Blackwell chip** is **twice as powerful in training AI models** and has **five times the capability in inference tasks**, reducing the resources needed for tasks like **training GPT models** from **8,000 Hopper GPUs** to **2,000 Blackwell GPUs** and **cutting power consumption** from **15 megawatts to four megawatts**.
 - Major companies like **Google, Amazon, Microsoft, and OpenAI** plan to use the **new chip** in **cloud-computing services and AI products**.
 - **Nvidia**, already the **third-most valuable US company**, saw its stock surge nearly **250%** in the past year, becoming the **world's most valuable chipmaker**.

Nvidia's Competitive Edge:

- **Full Stack Solutions:** Nvidia's success is attributed to its **proprietary software** and **comprehensive systems** that **optimize GPU features for AI**, positioning it ahead in the **AI chip race**.
- Overall, Nvidia's announcement of the **B200 'Blackwell' AI chip** marks a significant milestone in **computational efficiency and AI capabilities**, reinforcing the company's leadership in the **global GPU market** and indicating a promising future for AI technology development and adoption.

GPU Demand and Supply:

- The AI boom has significantly **increased** demand for **GPUs**, which are crucial for processing **large volumes of data in AI models**.
- Nvidia faces a **virtual monopoly** in the **GPU market**, leading to **order backlogs**. However, the **B200** promises to alleviate some of these shortages.
- **Moody's 2024 AI Outlook:** Anticipates increased AI spending and adoption, with a gradual improvement in the supply of **high-performance GPUs**.
- Nvidia's **dominance** in the **GPU market** is expected to continue, with **GPUs** becoming **increasingly central to AI applications**, shifting the **hardware equation from CPUs to GPUs**.

Elon Musk's Neuralink shows first brain-chip patient playing online chess

Section: Awareness in Computer and IT

Context:

- Elon Musk's brain-chip startup **Neuralink** live streamed on **Wednesday its first patient implanted with a chip using his mind to play online chess**.

More on news:

- Noland Arbaugh, the 29-year-old patient who was paralyzed below the shoulder after a diving accident, played chess on his laptop and moved the cursor using the Neuralink device.
- 29-year-old Noland Arbaugh is the first human patient to get implanted with the Neuralink device that reads signals from the brain.
- The implant seeks to enable people to control a computer cursor or keyboard using only their thoughts.
- Musk in January this year announced that the first implant was successful and that the patient was able to "move a cursor" using the interface.

About Neuralink:

- **Neuralink is working on developing a brain-computer interface** that is designed to help patients with paralysis or other conditions control computers and other electronic devices using neural signals.
- The **US Food and Drug Administration** gave **Neuralink** clearance to conduct its first trial to test its implant on humans last year.
- The **study used a robot to surgically place a brain-computer interface in a region** of the brain that controls the intention to move.

Digital financial frauds in India: a call for improved investigation strategies

Section: Awareness in IT and computers

Context:

A recent report by the Indian Cyber Crime Coordination Centre revealed that digital financial frauds accounted for a staggering ₹1.25 lakh crore over the last three years.

More on news:

- **Cybercrime** poses a burgeoning threat in India, impacting millions of individuals and organizations.
- According to the **National Crime Records Bureau (NCRB)**, **cybercrimes in India in 2023** resulted in a staggering loss of ₹66.66 crore, with 4,850 reported cases. A recent report by the Indian Cyber Crime Coordination Centre (I4C) revealed that digital financial frauds accounted for a staggering ₹1.25 lakh crore over the last three years.
- According to the **National Cybercrime Reporting Portal (NCRP)**, in 2023, at least ₹10,319 crore was reported to be lost by victims of digital financial fraud. According to the report, the number of complaints received in 2023 alone was 6.94 lakh.

How digital frauds work

- While various names have been given to diverse types of frauds, the general modus operandi of a fraudster is any one of the following:
- (a) convincing the victim to send money, either by impersonation (fake WhatsApp/FB/Insta, social media profiles) or by giving them a false promise of greater return (investment, crypto, held up custom package etc.)
- (b) by taking credentials such as Unified Payments Interface ID (UPI), Personal Identification Number (PIN), One-Time Password (OTP) or Internet banking ID/password from the victim and then using the same on other apps/websites and transferring money without the knowledge of the victim.
- For this the customer will either be given a fake link which looks exactly like a UPI app screen/banking website or the victim will be conned into installing a screen sharing app.
- The scammers can also convince the victims over phone to give out those details.
- When these details are used on official banking apps this gives the fraudsters access to even the Fixed Deposits/Recurring Deposits which are also siphoned out in most cases.

After the scam

- After a fraudster empties a victim's bank account, the money undergoes a series of circulations in broadly three stages.
- The first stage is a temporary account into which the fraudsters transfer victims' money.
- This account will be used to receive money from various other victims as well. From here, the money is then transferred into a second stage account.
- The second category of accounts are a group of accounts among which money is circulated.
- There are a lot of middlemen who are money circulators.
- Their task is only to receive money from first level bank accounts for a nominal cut.
- The victim's money is then split into small parts and then circulated within these accounts, by a person who is sitting in a different corner of the country.
- After sufficient churning, the money is then transferred into a third stage account which is a sink account.
- This can be a bank account, an e-wallet etc. Here, the total defrauded amount from a group of victims is re-collected.
- The money is then withdrawn in a large chunk through conventional methods of either ATMs/cheques or e-wallet cash outlets such as an e-wallet payments bank.

How can frauds be prevented

- Most frauds can be prevented with some basic technological interventions:
- Firstly, just as Google accounts do not allow logging in from a new device unless permission is granted by the former, financial institutions must be mandated to replicate this feature in their apps.
- As soon as a UPI ID, password or OTP is entered in a different device, an alert must be generated in a previous device with no further action being allowed until it is approved by the person.
- Secondly, the screen share facility must be disabled.
- Banking and financial apps must disable screen-sharing to run on top of them. And finally, in the bank statement, all banks/NBFCs/SEs must be mandated to provide comprehensible data. Currently only partly printed numbers are shown which even knowledgeable customers are unable to understand.
- The transaction description must contain the receiver's account/mobile or any other identifying number irrespective of it being within the same bank or to an outside bank.
- One of the biggest hindrances law enforcement agencies face is in following the money trail.
- The siphoned off money hops across bank accounts and wallets within minutes but supervised entities / banks / NBFCs / wallets are not able to give the required details to agencies with the same speed.
- Most of the crime is reported after 24 hours of the commission.

Speeding up information access

Certain basic changes to the form of data provided to enforcement agencies can help in minimizing delays:

- **(a) the banks/NBFCs/SEs must be mandated to provide data in a predetermined format with all the terms explained.**
 - The data must be given in a CSV or XLSX file. For example, the CDR (Call Data Record) shared to enforcement agencies has a fixed format and fixed file types, such as .CSV or .XLSX.
 - Currently the banks give the statement either in a printed hardcopy or in PDF format.
 - This causes huge inconveniences to the investigating officers.

- Most tech-savvy officers are often held back only because they do not get the data in a usable format.
- **(b) The International Mobile Equipment Identity (IMEI) must be recorded.**
 - All banking and financial apps must be mandated to save IMEI details of the device being used.
 - Fraudsters use fake mobile numbers and fake bank accounts which span across different States with the goal of adding layers to increase anonymity and preventing agencies from prosecuting them.
 - Thus, the IMEI becomes crucial evidence in determining the device and its location.
 - Recording IMEI will make for stronger evidence in establishing a device and its connection to fraudsters in a court of law.

The road ahead

- The **Bharatiya Nagarik Suraksha Sanhita 2023** which is set to replace the Indian Penal Code of 1861, recognises ‘organized crime’ as a “continuous unlawful activity”.
- Digital financial frauds are very much covered in this definition.
- Law enforcement agencies face a lot of difficulties in conducting interstate raids and arrests.
- It requires a large team and coordinated effort. Interstate digital financial fraud networks must be recognised as a serious crime and bail may be restricted by the Courts.
- Additionally, digital frauds create a considerable amount of black money when seen from a macroeconomic perspective.
- The **Indian Cyber Crime Coordination Centre (I4C)** was inaugurated by the government to deal with all types of cybercrimes in a comprehensive and coordinated manner.
- It will be set up under the newly created **Cyber and Information Security (CIS) division of the MHA.**

It has seven components:

- **National Cyber Crime Threat Analytics Unit**
- **National Cyber Crime Reporting Portal**
- **National Cyber Crime Training Centre**
- **Cyber Crime Ecosystem Management Unit**
- **National Cyber Crime Research and Innovation Centre**
- **National Cyber Crime Forensic Laboratory Ecosystem**
- **Platform for Joint Cyber Crime Investigation Team.**

Functions:

- The I4C will assist in centralising cyber security investigations, prioritise the development of response tools and bring together private companies to contain the menace.

National Cyber Crime Portal

- It is an initiative of **Ministry of Home Affairs**, Government of India under **National Mission for the safety of women** to facilitate victims/complainants to report cybercrime complaints online.
- This portal caters to complaints **pertaining to cyber-crimes only with special focus on cyber-crimes against women and children.**
- It caters all types of cyber-crime complaints including complaints pertaining to **online Child Pornography (CP), Child Sexual Abuse Material (CSAM) or sexually explicit content such as Rape/Gang Rape (CP/RGR) content** and other cyber-crimes such as **mobile crimes, online and social media crimes, online financial frauds, ransomware, hacking, cryptocurrency crimes and online cyber trafficking.**
- The portal also provides an option of **reporting an anonymous complaint** for reporting online Child Pornography (CP) or sexually explicit content such as Rape/Gang Rape (RGR) content.
- Complaints reported on this portal are dealt by law enforcement agencies/ police based of respective States/ UTs on the information available in the complaints.

How are semiconductors fabricated?

Section: Awareness in IT and computer

What are semiconductors?

- Semiconductors represent a distinct class of materials that possess some of the electrical properties of both conductors and insulators.
- Like a faucet can be used to control the flow of water, semiconductors can be used to control the flow of electric currents, and with exquisite precision.

Semiconductor tech: What exactly is India going to manufacture?

- The most **important type of a semiconductor is the transistor.**
- At the dawn of the era of modern electronics, **the first integrated circuits featured four transistors.**
- Together, they **controlled the flow of currents in such a way that the circuits could perform simple arithmetic operations.**
- Today, we have **single chips boasting billions of transistors.**
- Fitting so many transistors on a tiny chip no bigger than a fingernail requires extreme precision and a microscopic eye for detail.
- For instance, the accuracy required is equivalent to dividing a strand of human hair into a thousand segments each of specific width, and further subdividing each segment into a hundred parts.
- This is why **fabricating semiconductors involves cutting-edge technology and science.**

How are semiconductors made?

- The process starts with an engineer carefully selecting a silicon wafer as the foundation on which the semiconductor will be built. A team puts silicon, sourced from sand, through a meticulous purification process to separate it from other substances, until they have an ultra-pure wafer with impurity levels as low as a few parts per billion. (This percentage is comparable to an error of merely 1 cm when measuring the earth's diameter.)
- Next is the photolithography process – a crucial step that carves the circuit pattern on the wafer.
- The wafer is coated with a light-sensitive material called a photoresist.
- Then, a mask is held in front of the wafer and light is shined on it.
- The mask contains small gaps in the shape of the circuit pattern.
- The light passes through these gaps and erodes the underlying parts of the photoresist.
- As a result, the photoresist on the wafer 'acquires' the pattern of the transistor circuits.
- Following photolithography, engineers use chemical and/or physical techniques to remove the uncarved parts of the photoresist, leaving behind the circuit's structure on the silicon substrate.
- Then they dope the semiconductor – i.e. deliberately add impurities to specific parts of the semiconductor to alter its electrical properties, and deposit thin layers of materials such as metals or insulators to the wafer's surface to form electrical connections or insulate components.
- Then the resulting product is packaged – individual chips are separated, encapsulated, and tested to make sure they're functional and reliable – and finally integrated into electronic devices.

What does the fabrication landscape look like?

- Each step-in semiconductor fabrication demands ultra-high precision and harnesses a blend of diverse scientific principles.
- To achieve this, the High NA EUV machine made by the Dutch company ASML uses a cannon to shoot a 50-micrometer blob of liquid tin at 300 km/hr through a vacuum chamber, where laser beams blast it with enough energy to form a plasma that finally emits the requisite wavelength of radiation.
- India boasts a leading role in chip design centered in Bengaluru.

How do semiconductors benefit us?

- Smartphones and computers showcase the pinnacle of semiconductor technology but semiconductors influence nearly every facet of our lives.
- Semiconductors also power 'smart' air-conditioners' ability to regulate the temperature as well as space telescopes' ability to capture both awe-inspiring and scientifically interesting images in the depths of the universe, and many other technologies in between

Why India urgently needs a legal framework for genomics

Section: Biotech

Advances in Genomics:

- The past two decades have witnessed remarkable progress in **genomics**, highlighted by the **ability to sequence, analyze, and interpret genomes on an unprecedented scale**.
- The **dropping costs of sequencing** forecast a **surge in clinical genome sequencing applications**. **Population-scale genome programs worldwide** are laying the groundwork for a **significant shift in healthcare and research**.

India's Progress:

- **India's journey in human genomics** began with its **first genome sequencing in 2009**, reaching **1,000 genomes by 2019**, and recently completing **10,000 genomes**.
- These milestones have provided valuable insights into **population-specific diseases, prevalence rates**, and have underpinned **decision-making and research acceleration**.
- **Challenges and Opportunities:**
 - Given **India's vast, diverse population of over 1.4 billion**, there is a **critical need for ambitious and practical strategies to ensure genomics benefits reach everyone**. This requires **large-scale sequencing efforts, a robust legal and policy framework, and active industry participation**.
- Establishing a legal framework for data protection is urgent. While the **Health Ministry Steering committee clearances** are required for **research collaborations**, the **Director General of Foreign Trade notification enables samples to cross borders for commercial purposes**, leading to **foreign entities conducting research on Indian samples without significant local oversight**.
- **Genetic testing services in India** operate in **silos**, creating **fragmented genetic data pools**. **Aggregating test results could enhance public health decisions but lacks a system for collection and analysis, hindering accessibility for health policy-making**.
- The **potential for genetic information discrimination exists without laws to prevent it**, affecting **insurance and societal treatment**. Moreover, market forces may **exacerbate healthcare access disparities**, particularly **affecting the poor and ethnic minorities**. **Ensuring diversity in genetic data is essential** to avoid exacerbating healthcare inequalities.
- **Ethical usage of genomics is crucial**. This includes **evidence-based application, ensuring test quality, and preventing misuse**. Countries have **developed guidelines and policies for ethical genomics use**, a model **India** needs to adopt supported by legal measures.

The Role of Policies:

- Effective regulations and clear policies are vital for **advancing human genomics ethically and equitably**. They **foster trust, encourage collaboration, and support innovation**, aligning with **societal needs to maximize healthcare benefits** from genomics.
- **India has the potential to lead in making genomics accessible on a massive scale**, offering significant health and quality of life improvements. Achieving this requires **proactive efforts in policy-making, regulation, and ensuring ethical and equitable use of genomics technologies**.

Scientists genetically modify 'sexual' fruit fly to reproduce asexually

Section: Biotechnology

Context:

- In a recent development, researchers from **Cambridge University** and the **California Institute of Technology** achieved a significant milestone by **engineering a sexually reproducing species of fruit fly (*Drosophila melanogaster*) to reproduce asexually**.
- This **transformation**, demonstrating the **extensive biological implications of minor genetic modifications**, was first reported in a study published in July 2023, with a follow-up study appearing in the February 2024 issue of *Heredity*.

The *Drosophila* family:

- The ***Drosophila* family** encompasses over **1,600 identified species**, showcasing a broad spectrum of natural diversity. Among these, researchers have discovered a unique case of **parthenogenesis, a type of reproduction where females produce offspring without male fertilization**.
 - **Parthenogenesis** is a form of reproduction in which an egg can develop into an embryo without being fertilized by a sperm.
- Specifically, the species ***Drosophila manglebeirai*** consists **solely of females that can lay eggs developing directly into new female progeny without sperm**.
- Furthermore, **approximately 76% of *Drosophila* species**, typically **reproducing sexually**, have shown the **capability to hatch a minor fraction of eggs laid by isolated virgin females into larvae**, and an even smaller fraction of these can develop into adults.

- This occasional capability for **parthenogenesis** is termed **facultative parthenogenesis**, with **Drosophila mercatorum** being an example. However, **Drosophila melanogaster**, the **canonical species** extensively used in genetics research, **engages strictly in sexual reproduction**, highlighting the diverse reproductive strategies within the Drosophila family.

The genes for parthenogenesis:

- The research **aimed** to unveil the **genetic mechanisms enabling parthenogenesis** in **Drosophila mercatorum** and to replicate these conditions in **Drosophila melanogaster** to induce **parthenogenesis**.
- Through **RNA sequencing**, **44 genes** were identified in **D. mercatorum eggs** that exhibited **differential expression** during **parthenogenetic development** compared to their **sexually reproducing counterparts**.

Engineering asexual reproduction:

- Researchers succeeded in **engineering asexual reproduction** in **Drosophila melanogaster** by **manipulating the expression levels of specific genes** identified in **Drosophila mercatorum**, a species that **can reproduce through parthenogenesis**.
- By adjusting the expression of **44 genes** to match those found in the **parthenogenetic eggs** of **D. mercatorum**, they achieved **parthenogenesis in D. melanogaster**.
- Specifically, introducing **two additional copies of the pologene**, an extra copy of the **Myc gene**, and **reducing the expression of the Desat2 gene** resulted in **1.4% of D. melanogaster eggs** developing parthenogenetically into adults.
- These **parthenogenetically born flies** were also **capable of mating with males and producing offspring**, thus converting a species that reproduces strictly sexually into one that can reproduce facultatively through parthenogenesis.

The polar bodies:

- In the process of **sexual reproduction in flies**, each offspring inherits **two sets of chromosomes**, one from each parent, but **only transmits one chromosome from each pair to its eggs or sperm**.
- Following **fertilization**, the egg contains **five sets of genomes**: one in the maternal pronucleus, one in the paternal pronucleus, and three additional sets in nuclei called **polar bodies** located at the egg's periphery.
- **Polar bodies**, normally a **by-product of chromosome segregation**, are typically discarded as the **male and female pronuclei fuse** to form the **progeny nucleus**.
- However, in **unfertilized eggs** lacking the **male pronucleus**, the **female pronucleus alone cannot initiate embryonic development**.
- Researchers discovered that modifying the protein levels of **polo**, **Myc**, and **Desat2** made the **sequestration and disposal of polar bodies inefficient**, allowing them to potentially substitute for the **absent male pronucleus and initiate embryonic development**, thus enabling **parthenogenesis**.

Significance:

- This finding has significant implications for **pest control strategies** that involve releasing **sterilized males or males with genetically edited genomes** to **suppress progeny numbers**. Such approaches may inadvertently select individuals capable of facultative **parthenogenesis**, thereby **reducing their long-term effectiveness**.

Chinese dual-use cargo heading to Pakistan seized

Section: Defence

Context:

- Indian security agencies have intercepted a **Pakistan-bound ship from China at Mumbai's Nhava Sheva port**, suspected to be carrying a 'dual-use consignment' for Islamabad's nuclear and ballistic missile programme.

More on news:

- During its voyage, the **vessel reached Nhava Sheva Port (JNPT) Mumbai** on January 22, 2024 and the consignment was seized by Indian customs officials based on intelligence inputs on possible proliferation concerns by **Pakistan and China**.
- The same was intercepted at **Nhava Sheva Port on March 12, 2022**, under the policy to prevent proliferation activities through Indian ports.

Customs watchlist

- China was attempting to supply an autoclave to Pakistan under the cover of an '**industrial dryer**', which was seized from a **Hong Kong-flagged Chinese ship** named **Dai Cui Yun** which left Jiangyin port on the Yangtze river in **China's Jiangsu province**, and was headed to **Pakistan's Port Qasim**.

- The autoclave, which was mis-declared as an **'industrial dryer'**, is notified in the **SCOMET (Special Chemicals, Organisms, Materials, Equipment and Technologies)** list and was found concealed in the bottom of the cargo of the ship, as it transited through **Gujarat's Kandla port**.

U.S. sanctions

- In June 2023, the **U.S. Bureau of Industry and Security (BIS)** sanctioned **three Chinese companies i.e. General Technology Limited (which had supplied the autoclave), Beijing Luo Luo Technology Development, and Changzhou Utek Composite** — for their involvement in supplying missile-related items to Pakistan's ballistic missile programme.
- These sanctions were imposed as part of the global non-proliferation regime.
- China has also been assisting Pakistan in the construction of civil nuclear power plants, including four 300 MWe nuclear power plants at Chashma, and two 1,000 MWe plants in Karachi.

What are Dual Use Goods?

Dual-use goods are items that can be used both for civilian and military applications. These types of goods are heavily regulated because they can be classified for civilian use and then transformed for military purposes, or worse, used for terrorism.

Tri-service exercise 'Bharat Shakti' to demonstrate prowess of indigenously manufactured equipment

Section: Defence

Context:

- The **integrated tri-service exercise 'Bharat Shakti' at Pokhran field firing ranges in Rajasthan's Jaisalmer district on March 12** will showcase the shock and awe, maneuver and fighting capabilities of the armed forces.

More on news:

- **Mega exercise 'Bharat Shakti' to be held at Pokhran on March 12** is expected to be witnessed by Prime Minister Narendra Modi along with the top military brass and will showcase the **"shock and awe"** impact that the armed forces seek to achieve in an operational situation with maneuver and fighting capabilities.

About Bharat Shakti:

- 'Bharat Shakti' will demonstrate the prowess of indigenously manufactured defense equipment of the three services.
- The proceedings will commence with the **Army's Special Forces, MARCOS of the Indian Navy and GARUDS of the Indian Air Force**.
- The integrated tri-service firepower and maneuver exercise at Pokhran will be held for about 50 minutes.
- **LCA Tejas, ALH Mk-IV, LCH Prachand, mobile anti-drone system, BMP-II and its variants, NAMICA (Nag Missile Carrier), T90 tanks, Dhanush, K9 Vajra and Pinaka rockets** are among the platforms that will be demonstrated.
- The first-of-its-kind exercise on such a scale is "not tailored towards any direction (northern or western border) or any adversaries".
- Various types of Radar, UAV-launched precision-guided munition, Quick Reaction Fighting Vehicles, and drones of various types, including logistic drones and swarms of drones, and 3D-printed bunkers will be part of the exercise.
- The global share in Indian armed forces capability development projects has steadily declined, whereas the share of the domestic component has increased considerably.

Pokhran

- Pokhran is a remote location in the **Thar Desert of Rajasthan's Jaisalmer district**.
- With the approval of the then prime minister Indira Gandhi, the Test Range in Pokhran hosted the detonation of **India's first nuclear device in 1974**.
- The test was known as a **"Peaceful Nuclear Explosive"** among government officials. After the detonation, it came to be known as **Operation Smiling Buddha** while the MEA called it "Pokhran I".
- The Bhabha Atomic Research Centre preferred to conduct the tests in the **remote desert of Rajasthan due to the topography and the weather of the region**.
- The test was conducted during the month of May when the wind in the region created **serious sandstorms**. The sandstorms obstruct a clear view to **American spy satellites**.
- Also, the **infrared sensors do not pick up such activity due to the temperature that increases over 50 degrees during the daytime**.
- To maintain the secrecy of the test the Bhabha Atomic Research Centre conducted the nuclear test in Pokhran.
- After conducting the test, the government announced that it did not intend to manufacture nuclear weapons but just wanted to make India self-reliant in nuclear technology.

- Twenty-four years after the first test was conducted, the Indian Defence Research and Development Organisation and Atomic Energy Commission conducted five more nuclear tests on May 11, 1998.

About LCA Tejas:

- The Light Combat Aircraft(LCA) programme was started by the Government of India in 1984 when they established the **Aeronautical Development Agency (ADA)** to manage the LCA programme.
- It replaced the aging Mig 21 fighter planes.
- Designed by –Aeronautical Development Agency under the Department of Defence Research and Development.
- Manufactured by -State-owned **Hindustan Aeronautics Limited(HAL)**.
- **It is the lightest, smallest and tailless multi-role supersonic fighter aircraft in its class.**

About LCH Prachand:

- The Indian Air Force formally inducted the indigenously developed **multi-role Light Combat Helicopter (LCH)**, Prachanda which is suitable for operating in high-altitude battlefields.

About NAMICA:

- Nag is a **third-generation, fire-and-forget**, anti-tank guided missile developed by India's state-owned Defence Research and Development Organisation (**DRDO**) to support both **mechanized infantry and airborne forces** of the Indian Army.
- It is an all weather condition with day and night capabilities and with a **minimum range of 500m and maximum range of 4 km.**
- Nag can be launched from land and air-based platforms. The land version is currently available for integration on the Nag missile carrier (NAMICA)

About T90 tank:

- The T-90 is a **third-generation Russian** main battle tank developed to **replace the T-72.**
- It uses a **125 mm 2A46 smoothbore main gun**, the 1A45T fire-control system, an upgraded engine, and gunner's thermal sight.

About K9 Vajra:

- The K9 VAJRA-T **155mm/ 52 is a tracked self-propelled howitzer** (a short gun for firing shells on high trajectories at low velocities), which has its roots in the **K9 Thunder**, the mainstay of the **South Korean Army.**
- It offers a high rate of fire at long-range and is compatible with Indian and standard North Atlantic Treaty Organisation (NATO) ammunition.
- The K9 Thunder platform is made of **all-welded steel armor protection material.**

About Pinaka:

- The Pinaka, which is primarily a **multi-barrel rocket system (MBRL)** system, can fire a salvo of 12 rockets over a period of 44 seconds.
- In the battlefield, long range artillery systems like Pinaka are used for attacking the adversary targets prior to the close quarter battles which involve smaller range artillery, armoured elements and the infantry
- The development of the Pinaka was started by the Defence Research and Development Organisation (**DRDO**) in the late 1980s, as an alternative to the multi-barrel rocket launching systems of Russian make, called the 'Grad', which are still in use.

All about India's indigenous fifth-gen fighter jet Advanced Medium Combat Aircraft (AMCA), and why it is important

Section: Defence

Context:

- The **Cabinet Committee on Security (CCS)** this week cleared a Rs 15,000 crore project to design and develop the **Advanced Medium Combat Aircraft (AMCA), India's fifth-generation fighter multirole fighter jet.**

More on news:

- The **Aeronautical Development Agency (ADA)** under the **Defence Research and Development Organisation (DRDO)** will be the nodal agency for executing the programme and designing the aircraft.
- It will be manufactured by **state-owned Hindustan Aeronautics Limited (HAL).**
- The aircraft will put India in a select group of nations that have their own **fifth-generation fighter aircraft.**

Features of AMCA

STEALTH:

- The **25-tonne twin-engine aircraft**, which will be bigger than other fighters in the Indian Air Force inventory, will have advanced stealth features to avoid detection by enemy radar.

FUEL & WEAPONS:

- The aircraft will have a large, **concealed internal fuel tank of 6.5-tonne capacity**, and an **internal weapons bay for a range of weapons, including indigenous weapons**, to be buried in its belly.

ENGINE:

- The AMCA Mk1 variant will have the **US-built GE414 engine of the 90 kilonewton (kN) class**, while the more advanced **AMCA Mk2** will fly on the more powerful 110kN engine, which will be developed indigenously by **DRDO's Gas Turbine Research Establishment (GTRE)** in collaboration with a foreign defense major.
- Other features such as a diverterless supersonic inlet for controlling air flow into the engines, and a serpentine air intake duct to shield the engines from radar emissions, are likely to be part of the AMCA.

Why AMCA is special

- The initial plan was to jointly develop the aircraft with **Russia under a Fifth Generation Fighter Aircraft (FGFA) programme**.
- India withdrew from the **FGFA project in 2018**.
- The AMCA will be **India's indigenous fifth-generation fighter aircraft**.
- The indigenous **Light Combat Aircraft (LCA) Tejas is a 4.5-generation single-engine multirole aircraft**.
- Stealth features such as an internal weapons bay and a bigger internal fuel tank are part of **fifth-generation aircraft like AMCA**.
- External fuel tanks and externally attached weapons leave a huge signature and are easy to detect for radar.
- This will be aided by the inclusion of a **comprehensive Integrated Vehicle Health Management (IVHM) system** to keep track of multiple structural components, and to assess the condition of the aircraft in real-time.

Other fifth-generation fighters

- Only a few countries have built a **fifth-generation stealth fighter aircraft**.
- The list of the aircraft currently in service includes the **F-22 Raptor and F-35A Lightning II of the US, the Chinese J-20 Mighty Dragon, and the Russian Sukhoi Su-57**.

One missile, many weapons: What makes the latest Agni-5 special?

Section: Defence

Context:

- India has successfully tested an Agni-5 missile equipped with **MIRV technology**, joining a small group of countries with this capability.

More on news:

- Vice-President lauds the success of Mission Divyastra, the first flight test of indigenously developed Agni-5 missile.
- The Agni-5 missile is capable of carrying multiple warheads and striking multiple targets.
- The most important thing about this new missile is its integration with what is known as the **MIRV technology**.
- An **MIRV-equipped missile has never been used so far** in any conflict situation.
- Arms control advocates argue that **MIRV technology** incentivises the urge to strike first, thus increasing the risk from nuclear weapons.

What is Mission Divyastra?

- The successful launch of **Mission Divyastra** by Prime Minister Narendra Modi is an important milestone in India's nuclear capability.
- This is the first flight test of indigenously developed **5,000-km range Agni-5 nuclear missile, equipped with the Multiple Independently Targetable Reentry Vehicle (MIRV) technology**.

What is MIRV technology?

- **MIRV (Multiple Independently Targetable Re-entry Vehicle) technology** is the capability that allows multiple warheads to be loaded on a single missile delivery system and programmed to hit different targets, thus greatly enhancing the missile's destructive potential.

- The development of **MIRV capability marks a significant upgrade for India's missile systems, and expands its nuclear options.**
- Traditional missiles carry a **single warhead, or weapon, that goes and hits the intended target.**
- **MIRV-equipped missiles can accommodate multiple warheads, each of which can be programmed to strike a separate target.**
- They can all be made to hit the same location too, one after the other, thus ensuring complete annihilation of the target.

Origin of MIRV technology:

- The technology is not new.
- It was developed in the 1960s and first deployed in the 1970s by the United States and the then Soviet Union.
- The warheads have to be miniaturized, be equipped with independent guidance and navigation controls, and **released sequentially from the delivery system.**
- Over the years, **France, the United Kingdom, and China have developed this technology.**
- Pakistan too has claimed to have tested an MIRV-equipped missile called Ababeel, first in 2017 and then in 2023.

Advantages of MIRV technology

- Apart from the obvious advantage of inflicting multiple damages with a single strike, MIRV is a sought-after military technology for several other reasons.
- It has the ability **to penetrate missile defense systems.**
- A missile defense system is a network of technologies aimed at detecting, tracking, intercepting and **destroying an incoming missile.**
- It involves the deployment of sophisticated radars, communication systems, and interceptor missiles.
- It's considered a good **safeguard against traditional missiles, and several countries are in the process of developing or strengthening their missile defense systems.**
- MIRV-equipped missiles, however, can render the system useless.
- Multiple warheads, each with an independent trajectory, can make the job of tracking and **intercepting extremely complicated.**
- MIRV-equipped missiles can be made to carry decoy warheads to confuse the defense system.
- The response strike could be disproportionate, and can thus serve as a deterrence to the enemy.

Agni upgrade

- The integration of **MIRV technology is a long-awaited upgrade for the Agni family of short, medium and intercontinental range ballistic missiles indigenously developed by the DRDO.**
- Agni missiles are the main land-based delivery systems for India's nuclear weapons.
- Developed in the 1990s, **the first-generation Agni missiles were deployed in the armed forces in the mid-2000s.**
- **Agni-1 to Agni-IV missiles have ranges between 700 to 3,500 km** and can carry single payloads weighing between 12 and 40 kilotons.
- Agni-5, the version that has been equipped with MIRV technology, can travel **more than 5,000 km**, and can potentially enter the intercontinental range as well, considered to be 5,500 km and above.
- Its previous flight happened in December 2022, when its night-time capabilities were tested, among other things.
- DRDO has also been developing Agni-P missiles, which are modernized versions of the short-range Agni-1 and Agni-2 variety.

With Agni V test, India makes the MIRV leap

Section: Defence

Context:

- On March 11, **Prime Minister Narendra Modi** announced on social media the **successful flight test of an Agni V ballistic missile with multiple independently targetable reentry vehicle (MIRV) technology.**

What are MIRVs and why are they significant?

- A MIRV is a **'missile bus' whose passengers** are nuclear bombs and which facilitates a single booster to deliver them to different targets.
- MIRVs are a **"force multiplier" because one MIRV-ed missile can strike several targets.**
- MIRVs are also useful for saturating and penetrating ballistic missile defenses.

- In 1970, the U.S. started to deploy the Minuteman III, the first MIRV-ed intercontinental ballistic missile (ICBM) with three warheads on each missile.
- In 1971, it deployed the Poseidon, the first MIRV-ed submarine-launched ballistic missile (SLBM).
- The Soviet Union followed the U.S. and by the 1970s developed its own MIRV-ed ICBM and SLBM technology.
- The U.K. and France also possess the technology.
- China has developed and deployed MIRV technology with multiple warheads placed on its DF-5B ICBMs and is fast expanding and modernizing its nuclear arsenal.

What was the Mission Divyastra test?

- The MIRV system is equipped with indigenous avionics systems and high accuracy sensor packages that ensure the re-entry vehicles reach the target points with the desired accuracy.
- The ‘Agni’ series of missiles constitute the backbone of India’s nuclear weapons delivery, and Agni V is the longest range missile in the arsenal, with a reach of over 5,000 km.
- This means it can reach most of China, especially with a smaller warhead, which would increase the range further.
- MIRV technology gives better leverage in this regard.

EX TIGER TRIUMPH – 24

Section: Defence

Context:

- In consonance with the established partnership between India and the US, a bilateral tri-Service Humanitarian Assistance and Disaster Relief (HADR) Exercise between both countries, Tiger Triumph – 24, is scheduled on the Eastern Seaboard from 18 to 31 Mar 24.

More on news:

- The Harbour Phase is scheduled from 18 to 25 Mar 24.
- Personnel from both navies would participate in Training Visits, Subject Matter Expert Exchanges, Sports Events and Social interactions.
- On completion of the Harbour Phase, the ships, with the troops embarked, would sail for the Sea Phase and undertake Maritime, Amphibious and HADR operations in accordance with injected situations.

Participants:

- Indian Navy Ships with integral helicopters and landing crafts embarked, Indian Navy aircraft, Indian Army personnel and vehicles and Indian Air Force aircraft and helicopters along with the Rapid Action Medical Team (RAMT) would be participating in the exercise.
- The US would be represented by US Navy Ships with embarked troops of the US Marine Corps and US Army.

Aim of the Exercise:

- The exercise is aimed at developing interoperability for conducting HADR operations and refine Standard Operating Procedures (SOPs) to enable rapid and smooth coordination between forces of both countries.

About Eastern Seaboard:

- The East Coast of the United States, also known as the Eastern Seaboard, the Atlantic Coast, and the Atlantic Seaboard, is the region encompassing the coastline where the Eastern United States meets the Atlantic Ocean.
- The Thirteen Colonies, which formed the United States in 1776 were located on this coast, and it has played an important role in the development of the United States.
- The region is generally understood to include the U.S. states that border the
 - Atlantic Ocean: Connecticut, Delaware, Florida, Georgia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Rhode Island, South Carolina, and Virginia, as well as the federal capital of Washington, D.C., and
 - non-coastline states: Pennsylvania, Vermont, and West Virginia

After 30 years, India began to make Penicillin G

Section: Health

Context:

The common antibiotic penicillin will be manufactured in the country for the first time in 30 years.

More on news:

- Forty greenfield projects under the PLI schemes for manufacturing bulk drugs and medical devices were inaugurated on Saturday.
- This **included 27 greenfield bulk drug projects** and 13 manufacturing plants for medical devices.
- The bulk drug parks will produce active pharma ingredients for commonly used drugs.

About Penicillin:

- **Penicillin is a medication** used to manage and treat a wide range of infections.
- It is in the **beta-lactam antibiotic class of drugs**.
- This **activity describes penicillin's indications, action, and contraindications as a valuable agent in treating infection**.

About Active Pharmaceutical Ingredients:

- These are the **active ingredients** contained in a medicine.
- It is that part of the **medicine that produces the intended therapeutic effects**.
- For example, in a painkiller, **the active ingredient relieves pain**.
- In the OTC drug Crocin, **the API is paracetamol**.
- Only a small amount of the **API is required to produce the effect and so the medicine contains only the required amount of the API**.
- **China is one of the largest producers of Key Starting Material (KSM) and APIs** in the world

About Production Linked Incentive (PLI) Scheme:

- The **scheme expected to give a fillip to the domestic drug manufacturing industry is the PLI Scheme**.
- This scheme aims to promote the domestic manufacturing of, apart from **APIs, drug intermediates and key starting materials (KSMs)**.
- In this scheme, financial incentives will be provided to eligible manufacturers of identified 53 critical bulk drugs on their **incremental sales over the base year (2019-20) for a period of 6 years**.
- The scheme will be implemented through a **Project Management Agency (PMA) to be nominated by the Department of Pharmaceuticals**.

Drugs in news:

- **Atorvastatin:** Reducing Cholesterol
- **Lopinavir:** Treating HIV
- **Acyclovir:** Treating infection such as shingles etc.

Why obesity, undernutrition high in India: what a Lancet study says**Section: Health**

Context: Recently, **Lancet** published a study which says India has become one of the countries with a high **“double burden”**.

Details:

- As per the study, India has seen a constant increase in obesity levels both in adults and children over the last 32 years.
- The prevalence of undernutrition has also remained high in the country.
- The rise in obesity and undernutrition is due to lack of access to affordable and nutritious food for the prominence of undernutrition and obesity.
- According to study though lack of access to food can lead to undernutrition, increased access to processed foods high in fats, salt, and sugar has driven up obesity.
- As in 2022, about 12.5 million children aged between five and 19 in India were overweight.
- In India, the adult obesity rate increased from 1.2 per cent in 1990 to 9.8 per cent in 2022 for women and 0.5 per cent to 5.4 per cent for men.
- The total number of children and adolescents who were affected by obesity in 2022 was nearly 160 million (65 million girls and 94 million boys), compared to 31 million in 1990.

What are the parameters of being obese, underweight?

- According to the World Health Organisation (WHO), obesity is an abnormal or excessive accumulation of fat that poses health risks.
- Adults—anyone over the age of 20 years — are considered obese if they have a **body mass index (BMI) of 30 kg/m² or more**.
- BMI is a person's weight in kilograms divided by the square of height in meters, according to the Centers for Disease Control and Prevention. School-aged children and adolescents — anyone between the ages of 5 and 19 years— are considered obese if their BMI is two standard deviations more than the mean.
- Underweight is one of the four broad sub-forms of undernutrition. An adult is considered underweight if their BMI is less than **18 kg/m²**. Children are considered underweight if their BMI is two standard deviations below the mean.

Why are more women obese than men?

- Women do not have access to or time for physical activities such as walks or gyms.
- They are likely to put the nutrition of the family above theirs.
- They are also likely to have fewer hours of proper sleep

What is the role of socio-economic conditions?

- Obesity is no longer the disease of the rich in India
- Eating junk food is cheaper and easier
- While it is affecting more people, there continues to be a rural-urban divide in obesity.
- NFHS-5 data from last year shows that the prevalence of obesity was 31.7% in urban women and 19% in rural women. It was 28.6% among urban men and 18.8% among rural men. Undernutrition persists in remote and rural parts of poorer states.
- Undernutrition is prevalent in the extremely poor populations in states like Bihar, Jharkhand, or Odisha, where people might be eating just one meal a day

What are the impacts?

The health consequences of obesity are obvious. An increase in obesity, especially in children, is likely to lead to an increase in diseases such as diabetes, hypertension, heart attacks, and strokes. The effect of undernutrition, however, is not so obvious

A bold step towards a cervical cancer-free future

Section: Health

Context:

- The **interim Union Budget for 2024-25** notably emphasizes **women's health** and a standout feature of the budget is its support for **vaccinating girls aged nine to 14 years against cervical cancer**, representing a crucial step in **enhancing women's health and safety** in the country.

The '90-70-90' targets, global programmes:

- Despite healthcare advances, **cervical cancer** remains a significant challenge in **India**, being the **second most common cancer among women** with over **127,000 cases** and around **80,000 deaths annually**.
- The **human papillomavirus (HPV)** plays a **crucial role** in the **onset of cervical cancer**, prompting the **adoption of HPV vaccination** as a **key preventive measure**.
- The **World Health Organization (WHO)** has set ambitious **'90-70-90' targets for 2030: vaccinating 90% of girls by age 15, screening 70% of women by ages 35 and 45, and treating 90% of women with cervical cancer**.
- These goals are central to the global effort to **eradicate cervical cancer** and highlight the **critical importance of India's initiative for HPV vaccination**.
- Globally, over **100 countries** have introduced **HPV vaccination programs**, significantly **reducing cervical cancer incidence**.

International and regional efforts:

- Notable examples include **Scotland**, where **fully vaccinated women** born between **1988 and 1996** have shown **no cervical cancer cases**, and **Australia**, which is **on track to eliminate cervical cancer by 2035**.
- **Rwanda's successful vaccination campaign** has markedly **decreased HPV prevalence among women**, demonstrating the **vaccine's effectiveness** in preventing cervical cancer.
- In the **Southeast Asia Region**, **six countries**, including **Bhutan, Indonesia, the Maldives, Myanmar, Sri Lanka, and Thailand**, have rolled out **national HPV vaccination programs**.

- **Bhutan**, in particular, has achieved a **95% vaccination rate** among **targeted girls** since introducing the program in **2010** and has **extended vaccination to boys in 2021**. Research in **Bhutan** has shown a **reduction in the prevalence of vaccine-targeted HPV types**, evidencing the program's impact on reducing **HPV transmission within the community**.
- These **international and regional efforts** underscore the **vital role of HPV vaccination in combating cervical cancer**.

The Sikkim model:

- **Sikkim's successful HPV vaccination campaign**, achieving a remarkable **97% coverage in 2018**, showcases the importance of **comprehensive communication strategies in public health initiatives**.
- This approach involved **educating teachers, parents, girls, health-care workers, and the media** about the **HPV vaccine's benefits**.
- **India's** development of its **indigenous quadrivalent HPV vaccine, Cervavac**, priced at **₹2,000 per dose** and created by the **Serum Institute of India** in collaboration with the **Department of Biotechnology**, represents a significant advancement in making the vaccine more accessible and affordable.
- The **potential expansion of India's vaccination program to include adolescent boys**, alongside recent evidence suggesting that a **single dose of the HPV vaccine may offer similar protection as multiple doses**, points towards a more **comprehensive strategy to combat HPV infections and related diseases**.
- **HPV vaccination's impact extends beyond individual health**, aiming to **reduce the societal and economic burdens of cervical cancer**, which predominantly affects **women in their prime years** and **imposes a heavy toll on families and communities**.
- By preventing **HPV infections**, vaccination not only **decreases the incidence of cervical cancer** and its **associated healthcare costs** but also **promotes the overall well-being and productivity of women**, ultimately benefiting society at large.

Meet the challenges:

- **India** faces challenges such as **vaccine hesitancy** and **ensuring equitable access to vaccination**.
- Addressing these issues requires **engaging with communities, combating misinformation, and enhancing healthcare infrastructure**.
- The introduction of **U-WIN**, akin to the **Co-WIN platform**, aims to **maintain an electronic registry of all immunizations in the country** and **allow for real-time responsiveness in vaccination programs**.

Novo valuation surpasses Tesla on experimental obesity drug data

Section: Health

Context:

- **Novo Nordisk's market valuation** has surpassed Tesla and Visa after announcing positive early trial data for a new obesity drug; shares rose over 8% to record highs.

More on news:

- Shares surged more than **8% to record highs, shooting Novo Nordisk up in global rankings to the 12th most valuable company from 14 previously**.

About the drug:

- Wegovy belongs to a class of drugs known as **GLP-1 agonists, originally designed to treat type 2 diabetes**, that have been shown to reduce food cravings and empty the stomach more slowly.
- **Wegovy was the first of a new group** of highly effective weight-loss drugs to be launched.
- Novo and Lilly are so far the leaders in the obesity drug market, forecast by analysts to be worth \$100 billion by 2030.
- **Wegovy** also had a clear cardiovascular benefit, boosting efforts by the company to move Wegovy beyond its image as a lifestyle drug.

Semaglutide

- Semaglutide injection is in a class of medications called incretin mimetics. It works by helping the pancreas to release the right amount of insulin when blood sugar levels are high. Insulin helps move sugar from the blood into other body tissues where it is used for energy.
- Novo Nordisk is the sole patent holder of semaglutide, the active ingredient in both Wegovy and Novo's diabetes drug Ozempic, which are not yet approved for sale in India

- Wegovy, Ozempic and Eli Lilly's Mounjaro and Zepbound belong to a class of therapies known as GLP-1 receptor agonists originally developed to control blood sugar in patients with type 2 diabetes. But they also slow digestion, helping patients feel full longer.
- Indian law allows drugs approved in foreign countries to be imported and sold in the country after obtaining an import license from the drug regulator by the original drug manufacturer's partner in India.
- Novo aims to officially launch Wegovy in India in 2026 after securing regulatory approvals
- Certain provisions of the law also allow drugs that have not been formally approved by the Indian drug regulator to be imported for individual use, provided patients make an appeal with valid prescriptions and proof of identity.

FAO publishes first national report on AMR surveillance in India's fisheries, livestock sectors

Section: Health

Report: Indian Network for Fishery and Animal Antimicrobial Resistance (INFAAR) Report 2019-22.

Published by: The report is a collaborative effort by the **Food and Agriculture Organization (FAO)**, and the **Indian Council of Agricultural Research (ICAR)**, with support from the **United States Agency for International Development (USAID)**.

Details:

- It marks the **first antimicrobial resistance (AMR) surveillance** trends report in **India's fisheries and livestock sectors**.
- **INFAAR**, encompassing **20 laboratories**, aims to inform policy and decision-making for AMR containment through data on AMR trends.

Multidrug Resistance (MDR) in Aquaculture and Livestock Sectors:

- **Escherichia coli** is a **gram-negative, facultative anaerobic, rod-shaped, coliform bacterium** of the genus **Escherichia** that is **commonly found** in the **lower intestine of warm-blooded organisms**.
- Most **E. coli strains** are **harmless**, but some **serotypes** such as **EPEC**, and **ETEC** are **pathogenic**.
 - **E. coli Isolates:**39% of **aquaculture-origin E. coli isolates** showed **multidrug resistance (MDR)**, meaning resistance to three or more classes of antimicrobials.
 - In **food-animal samples**, a significant pattern of **MDR** was observed, particularly against **cefotaxime-enrofloxacin** and **tetracycline**, with **12.6%** of isolates showing resistance. Notably, **15.8%** of poultry isolates displayed simultaneous resistance to these antimicrobials.
- **Extended Spectrum β -lactamase (ESBL) and AmpC β -lactamase Producers:** The study identified **370 isolates** of **ESBL-producing E. coli** and **292 isolates** of **AmpC type β -lactamase producers**, both associated with **MDR**.

Key Findings in the Fisheries Sector:

- **Surveillance covered three aquaculture systems: freshwater, brackish water, and marine.**
- Over **3,087 farms** across **42 districts** in **12 Indian states** were surveyed.
- A total of **6,789 bacterial isolates** (including species like **Staphylococcus aureus**, **E. coli**, and others) were analyzed.
 - **Staphylococcus aureus** is a **Gram-positive spherically shaped bacterium**, a member of the **Bacillota**, and is a usual member of the microbiota of the body, **frequently found** in the **upper respiratory tract** and on the **skin**.
 - **Methicillin-resistant S aureus (MRSA)** is a drug-resistant variant of **Staphylococcus**.
- **High resistance** was observed against **antibiotics** such as **penicillin** and **erythromycin** across different systems.
- Specific resistance patterns were noted for **Aeromonas species** in **freshwater systems** and **Vibrio species** in **saltwater environments**.

Key Findings in the Livestock Sector:

- Surveillance included **major food-producing animals** like **cattle, buffalo, goats, sheep, pigs, and poultry**.
- Out of **5,983 samples**, **2,076 E. coli** and **1,244 Staphylococcus** isolates were characterized.
- Notable resistance was observed against cefotaxime and **ampicillin** in **E. coli isolates**.
- Approximately **75%** of both **S. aureus** and **coagulase-negative Staphylococcus (CONS)** isolates exhibited penicillin resistance.
- **Poultry-origin isolates** displayed higher resistance rates compared to other food animals for all tested antibiotics.

Implications and Concerns:

- The report underscores the **critical issue of AMR** in both the **fisheries and livestock sectors** in **India**.
- The data highlight the urgent need for informed policy and measures to contain **AMR spread**, crucial for both human and animal health.

- Specific attention is needed to address the **high resistance rates** observed, particularly in pathogens that pose significant health risks to humans.
- This comprehensive surveillance data serves as a **foundation for future research, policy formulation, and targeted interventions to combat antimicrobial resistance** in **India's crucial agricultural sectors**.

Union Health Ministry launches National Action Plan for Prevention and Control of Snakebite Envenoming in India

Section: Health

Context:

- The Union Health Secretary launched a National Action Plan for Prevention and Control of Snakebite Envenoming (NAP-SE) in India.

More on news:

- An array of IEC materials including a booklet on Snakebite, Posters on “**Dos**” and “**Don'ts**” for the general community and a 7-minute video on Snakebite Awareness also launched.
- **Snakebite Helpline**, a vital resource that will provide immediate assistance, guidance, and support to individuals and communities affected by snakebite incidents will be piloted in five States (**Puducherry, Madhya Pradesh, Assam, Andhra Pradesh and Delhi**).
- **National One Health Programme for Prevention and Control of Zoonoses** onboarded on the Integrated Health Initiative Platform to strengthen surveillance of zoonotic diseases in the country.

About The National Action Plan for Snakebite Envenoming (NAPSE):

- **Vision:** “To prevent and control snakebite envenoming in order to halve the numbers of deaths and cases of disability that it causes by 2030”.
- **Mission:** To progressively **reduce the morbidity, mortality and its associated complications** in humans due to Snake bite.
- **The National Action Plan for Snakebite Envenoming (NAPSE)** provides a broad framework for management, prevention and control of Snake bite envenoming in India.
- The activities of human health component are already being implemented under snakebite prevention and control through the State and District Nodal Officer (SNO & DNO) under National Health Mission.
- Surveillance is a key element in NAPSE so that problems can be easily identified, and actions could be undertaken in a timely manner.

About Snakebite Envenoming:

- **Snakebite envenoming is a potentially life-threatening** disease following the bite of a venomous snake.
- In India, **around 50,000 deaths** occur of an estimated 3-4 million snake bites annually which accounts for half of all snakebite deaths globally.
- As per the **Central Bureau of Health Investigation (CBHI) reports (2016-2020)**, the average annual frequency of snakebite cases in India is around 3 lakhs and about 2000 deaths occur due to snakebite envenoming.
- In India, around 90% of snake bites are caused by the 'big four' among the crawlers - common krait, Indian cobra, Russell's viper and saw scaled viper.
- Administration of polyvalent anti-snake venom (ASV) containing antibodies against cobra, Russell's viper, common krait and saw scaled viper is effective in 80% of the snakebite cases, however, lack of trained human resources and health facilities to treat snakebite patients remains a cause of concern.

What makes snakebite a neglected tropical disease (NTD):

- There are four primary criteria that define an illness as a **neglected tropical disease (NTD), and snakebite envenoming satisfies each of them:**
- First, there is a **significant burden of mortality and morbidity** (as detailed in the answer to question 1) – snakebite envenoming is a high-impact disease.
- Secondly, **a majority of incidents of snakebite occur in the world's tropical and subtropical regions**, and it particularly impacts the poor – snakebite is a tropical disease.
- Thirdly, **snakebite is amenable to treatment, as well as prevention** – the impact of snakebite can be mitigated now if we make the effort to do so.

Finally, **the overall level of investment in research addressing snakebite**, from prevention to diagnosis to treatment and rehabilitation, is exceptionally low in comparison to its impact – snakebite is a neglected disease.

Govt. issues marketing code for pharmaceutical firms

Section: Health

Context:

- The **Department of Pharmaceuticals** introduced the **Uniform Code for Pharmaceutical Marketing Practices (UCPMP), 2024**, establishing specific guidelines for **pharmaceutical marketing** and **interactions with healthcare professionals**.

Key Guidelines:

- The terms **“safe”** and **“new”** for **drugs must be used cautiously**.
 - **"Safe"** should not imply **no side effects, toxic hazards, or risk of addiction without qualification**. **"New"** cannot be used for **drugs available or promoted in India for over a year**.
- **Medical representatives** are **prohibited from using inducements or subterfuge** for interviews with healthcare professionals and **cannot pay for access under any guise**.
- **Continuing Medical Education (CME)** engagements must follow a transparent, verifiable set of guidelines, prohibiting the conduct of such events in foreign locations.
- **Cash, monetary grants, and any form of pecuniary advantage or benefits to healthcare professionals or their family members** by companies or their agents (distributors, wholesalers, retailers, etc.) are **strictly prohibited**.
 - **Gifting by pharmaceutical companies** or their agents is **banned**.
- The UCPMP **mandates strict compliance** and will be widely circulated.
- **Drug promotion** must align with the **marketing approval terms**, prohibiting promotion prior to marketing approval receipt.
- Claims about a drug's usefulness must be based on up-to-date evidence evaluation.

Need for the guidelines:

- This organized approach to pharmaceutical marketing practices **aims to ensure ethical interactions between the industry and healthcare professionals** while safeguarding the **accuracy and integrity of drug promotion**.

Gut microbes that digest cellulose are declining, especially in industrialised nations

Section: Health

Context:

- A recent study, published in the journal *Science*, highlights the **link** between the **increasing consumption of processed food** and the **decline in gut bacteria capable of digesting plant cellulose**, particularly in **industrialized countries**.
- The research revealed **three new species of cellulose-digesting bacteria** in the **human gut**, previously **abundant in rural populations, ancient human societies, and great apes**, but now **diminished due to dietary changes**.

Key Findings:

- The study **identified three new gut bacteria species - Candidatus Ruminococcus primaciens, Ruminococcus hominiens, and Ruminococcus ruminiens** - which can **digest cellulose, a crucial component of plant fibre**.
- The **decline of these bacteria affects energy balance and various health aspects** since these microbes **transform indigestible plant compounds into short-chain fatty acids, supplying energy to the host**.
- Previously thought **absent in humans, cellulose-digesting microbes** were first confirmed in **2003**. The **newly discovered species are less common in industrialized nations compared to their prevalence in ancient and rural populations**.
- Researchers analyzed samples from **75 animal species, including wild and domesticated animals and various human cohorts**, using **known strains Ruminococcus champanellensis and Ruminococcus flavefaciens** as references to identify related species.
- The study found significant differences in the **prevalence of cellulose-degrading bacteria across populations**, correlating these differences with **dietary fiber intake**. **Rural and ancient populations, with higher fiber diets, showed greater prevalence** compared to those in **industrialized countries, where processed food consumption is higher**.

Significance of the study findings:

- This research underscores the **profound impact of dietary choices on gut microbiota** and, consequently, on **human health**.
- The **decline of cellulose-digesting bacteria** in people from **industrialized countries, due to lower dietary fiber intake, suggests a shift away from diets that support a diverse and healthy gut microbiome**.

Indian team uses repurposed drug to treat oral cancer subtype

Section: Health

Context:

- A **novel fusion transcript** in **head and neck cancer** identified by Mumbai-based researchers presents a **promising therapeutic target**.

Key Findings:

- The **fusion transcript** discovered can be **targeted by the FDA-approved deworming drug, pyrvinium pamoate**, to treat **head and neck cancer**.
- The study highlights the **fusion transcript's potential** in **altering cancer cell behavior** and **improving treatment approaches**.

Fusion Transcript and Its Implications:

- A **fusion transcript** occurs due to the **structural rearrangement of chromosomes**, leading to the **creation of a chimeric gene**. This study focused on the **UBE3C-LRP5 fusion**, resulting from **translocation** between **chromosomes 11 and 7**.
- Found in **5.3%** of the **151 Indian oral cancer patients** screened and **1.2%** of **502 Caucasian patients**. With around **200,000 new oral cancer cases annually** in **India**, this **fusion transcript** could be relevant for approximately **10,000-11,000 patients** each year.
- **Impact:** The **UBE3C-LRP5 fusion** activates the **Wnt/beta-catenin signaling pathway**, known for **promoting cancer cell growth, migration, and invasion**. This discovery marks a significant advancement in **understanding head and neck cancer**.

Pyrvinium Pamoate as a Potential Treatment:

- The **drug targets the signaling pathway** activated by the **fusion transcript**, significantly **reducing cancer cell aggressiveness** in laboratory studies and animal models.
- **Findings:** Genetic studies by the **Advanced Centre for Treatment, Research, and Education in Cancer (ACTREC)** team showed that **blocking the pathway downstream of the fusion transcript** curtailed **cancer cell proliferation** and **invasive capabilities**.
- **Future Prospects:** With promising animal study results, clinical trials in **oral cancer patients** are planned, leveraging the drug's established safety profile.

Significance of the research:

- The identification of the **UBE3C-LRP5 fusion transcript** and its targeting by an existing **FDA-approved drug** offers a **novel approach to treating head and neck cancer**, potentially applicable to other cancer types as well.
- The **findings** pave the way for **new therapeutic strategies**, emphasizing the **importance of genetic research in advancing cancer treatment**. The planned clinical trials will further elucidate the drug's effectiveness in a clinical setting.

International body recommends more sensitive test to indicate risk of developing diabetes

Section: Health

Context:

- The **International Diabetes Federation (IDF)**, in a position statement, has recommended the adoption of a **test measuring blood sugar one hour (1-h PG) after the load of Oral Glucose Tolerance Test (OGTT)** has been administered to check for diabetes risk.

More on news:

- A **“wealth of epidemiological data”** guided the confirmation of the superior purpose in using the **1-h PG (plasma glucose) over even fasting PG (FPG), HbA1c and 2-hour PG** across ethnicity, sex and age categories.
- The **1-h PG has been found to be a more sensitive biomarker** for the earlier identification of these high-risk individuals

Measurement of blood sugar:

- The measure of blood sugar one hour after a 75 gm sugar solution is consumed will be a far more sensitive and practical method to screen for intermediate hyperglycaemia (IH), earlier known as pre-diabetes, and **type 2 diabetes (T2D) in people at risk**.
- It recommends the use of the **cut-off points of 155 mg/dL for measuring IH, and 209 mg/dL for T2D**, meaning any figure higher than specified would indicate a higher chance of diabetes, even if the individual's fasting and two-hour values were normal.
- The **International Diabetes Federation (IDF)** has recommended the adoption of a **test measuring blood sugar one hour (1-h PG) after the load of Oral Glucose Tolerance Test (OGTT)** has been administered to check for diabetes risk.
- They have also recommended revising glycaemic thresholds to measure and predict the risk of developing diabetes.

- The **oral glucose test is the best for detecting the onset of diabetes at a future date**, and if it is not employed, many remain undiagnosed and untreated.

About Diabetes mellitus:

- **Diabetes mellitus** is a metabolic disease of high blood sugar (glucose) levels that result from problems with insulin secretion, its action, or both.
- Normally, **blood glucose levels are tightly controlled by a hormone produced** by the pancreas known as insulin.
- When blood glucose levels rise (for example, after eating food), insulin is released from the pancreas to normalize the glucose level.

Type 1 diabetes:

- An absolute lack of insulin, usually due to destruction of the **insulin-producing beta cells of the pancreas, is the main problem in type 1 diabetes.**
- It is to be due to an **autoimmune process, in which the body's immune system mistakenly targets its own tissues (islet cells in the pancreas.**
- This tendency for the immune system to destroy the beta cells of the pancreas is likely to be, at least in part, genetically inherited, although the exact reasons that this process happens are not fully understood.

Type 2 diabetes:

- **People who have type 2 diabetes** can still produce insulin, but do so relatively inadequately for their body's needs.
- Genetics plays a role in the **development of type 2 diabetes**, and having a family history and close relatives with the condition increases your risk; however, there are other risk factors, with obesity being the most significant.

Why Karnataka has banned food coloring used in gobi manchurian and cotton candy

Section: Health

Context:

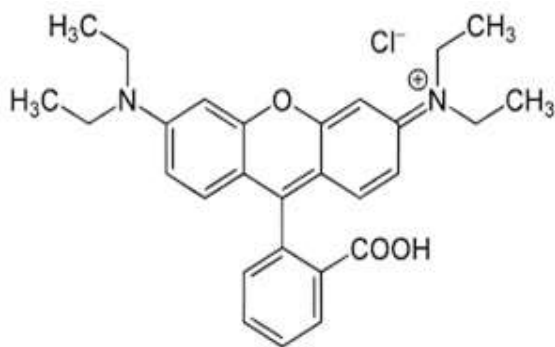
- The Karnataka Government has banned the use of harmful coloring agents in **cotton candy and "Gobi Manchurian.**

More on news:

- **Telangana Food Safety officials** detect cotton candy laced with carcinogen at Medaram Jatara
- On February 17, Tamil Nadu banned the sale of cotton candy or candy floss after analysis confirmed the presence of **Rhodamine-B, an industrial dye**, in samples lifted from stalls in Chennai.

About Rhodamine-B:

- **Rhodamine-B is a textile dye**, and its use in food has a huge impact on health.
- **Rhodamine-B is a fluorescent dye** used in cosmetics, textile and leather industries. It gives you brilliant pinks, greens and blues.
- It is used as a food coloring agent not only in cotton candy but also in the preparation of sweets, various **manchurian items and pakoras and in the preparation of sauces for Chinese food.**
- It is a chemical color used in dyeing clothes, paper, leather, printing, and plastics.
- It is used to give red **and pink colors.**
- **Long-term consumption** can cause allergies that can manifest in the form of irritation of the lip, tongue as well as eyes and also cause upper respiratory allergies.
- Studies have shown that **Rhodamine-B can cause cell death.**
- In long-term use, it can damage the cerebellum tissue and brainstem.
- There is recent evidence that it damages the kidney, liver and increases the risk of stomach tumor.
- It is not a food color but is toxic to the **human body and is a carcinogen.**
- The **International Agency for Research on Cancer — the World Health Organization** body that maintains a list of cancer causing agents — says it **cannot be classified as carcinogenic** to humans, there are some studies on rats that have shown carcinogenic effects.



FSSAI approved food colors:

- The natural food colors whose use is allowed includes **carotene and carotenoids (yellow, orange), chlorophyll (green), riboflavin (yellow), caramel, Annatto (orange-red, derived from the seed of an American tree), saffron, and curcumin (yellow, from turmeric).**
- The synthetic colors allowed include red from **Ponceau 4R, Carmoisine, and Erythrosine; yellow from Tartrazine and Sunset Yellow FCF, blue from Indigo Carmine and Brilliant Blue FCF, and green from: Fast Green FCF.**

Vaccine for dengue may be out in markets by mid-2026, says IIL

Section: Health

Context:

- **Indian Immunologicals Limited (IIL)**, a subsidiary of the **National Dairy Development Board**, has **completed the first phase of clinical trials** for a **dengue vaccine**, which focused on **assessing safety**.

Details:

- The **vaccine's efficacy** will be tested in the upcoming **second and third phases of trials**, with a **commercial release** anticipated by **mid-2026**.
- The development of the **dengue vaccine** involved **sourcing virus strains** from the **National Institute of Virology**.
- Besides **dengue**, **IIL** is working on **vaccines** for the **Zika virus** and **Kyasanur Forest Disease (KFD)**, a **tick-borne viral disease** primarily **confined to Karnataka** and its border regions.
- The **Indian Council of Medical Research (ICMR)** has agreed to support the **clinical trials** for the **Zika vaccine** financially and is in discussions with **IIL** about **co-developing the KFD vaccine**.
- Additionally, **IIL** launched a **Hepatitis A vaccine** named **Havisure** in January of this year, which has been well received in the market.

Dengue:

- Dengue is a **vector-borne disease** transmitted by the bite of an infected **female Aedes Aegypti mosquito**.
 - This mosquito **also transmits chikungunya, yellow fever and Zika infection**.
 - *Aedes aegypti* is a **daytime feeder**. The peak biting periods are early in the morning and in the evening before dusk.
- There **are 4 serotypes of the virus** that causes dengue. These are known as **DEN-1, DEN-2, DEN-3, DEN-4**.
- The **symptoms** of the disease will begin anywhere between **three to fourteen days after the initial infection**.
- The symptoms include: High fever, Headache, Vomiting, Muscle and joint pains, Skin Rash
- Diagnosis of dengue infection is done with a **blood test**.
- There is **no vaccine or specific medication for dengue fever**. Patients should seek medical advice, rest and drink plenty of fluids.
- Dengue **cannot be spread directly from person to person**. However, a person infected and suffering from dengue fever can **infect other mosquitoes**.
- Most cases occur in **tropical areas of the world**, including the Indian subcontinent, Southeast Asia, Southern China, Taiwan, the Pacific Islands, the Caribbean, Mexico, Africa, Central and South America.
- WHO estimates **39 crore dengue virus infections per year**, of which 9.6 crore show symptoms.

Kyasanur Forest Disease (KFD):

- Also known as **monkey fever**, it is a **tick-borne viral disease** affecting **monkeys and humans**.
- Identified in **1957** in **Karnataka, India's Kyasanur Forest**.
- **Transmission** through the **bite of infected ticks** or **contact with blood/tissues of infected animals**. **Rare person-to-person transmission**.
- **Symptoms** include high fever, headache, muscle pain, vomiting, and can progress to hemorrhagic fever and neurological complications.
- **No specific treatment**; prevention focuses on **reducing tick exposure**, wearing protective clothing, and using tick repellents.
- A **vaccine is available** for **high-risk individuals** like forest and healthcare workers.
- **Control measures** involve surveillance, prompt diagnosis, treatment, and tick population control via habitat modification and acaricides.
- **Endemic to parts of India** (Karnataka, Maharashtra, Kerala, Tamil Nadu, Goa) with reports in **Sri Lanka** and **Malaysia**.

Indian Immunologicals Limited (IIL):

- IIL is a **subsidiary** of the **National Dairy Development Board**, based in **Hyderabad, Telangana, India**.
- Registered as a **Public Limited Company** under the **Companies Act, 1956**, by the **Ministry of Corporate Affairs (MCA Services)**.
- **Established** in **1982** by the **National Dairy Development Board**.
- Known for **developing vaccines** for both **veterinary** and **human use**, including those for **foot-and-mouth disease, rabies, bacterial infections, canine diseases, hepatitis, measles, MMR, and DPT**.
- Major supplier of **DPT, TT, and hepatitis B vaccines** to **India's Universal Immunization Programme**.
- Operates **three vaccine manufacturing facilities** in **India**: one in **Gachibowli-Hyderabad** for **vaccine production**, one in **Karakapatla-Hyderabad** for **animal health formulations and human vaccines**, and one in **Ooty** for the **human anti-rabies vaccine "Abhayrab"**.
- Has a **subsidiary** in **New Zealand, Pristine Biologicals Ltd**, involved in **serum production for vaccine manufacturing**.
- Launched the **measles and rubella vaccine 'Mabella'** for **children** on 25 November 2023, developed in partnership with **Polyvac Institute of Vietnam**, marking the **25th anniversary** of the **Human Biologicals Institute (HBI)** division in **Udhagamandalam (Ooty), Tamil Nadu**.

Axis Bank to support Tata Memorial-supported National Cancer Grid with ₹100 crore contribution

Section: Health

Context:

- Axis Bank extends support to the National Cancer Grid and Tata Memorial Centre and contributes Rs. 100 crores towards enhancing research, innovation and digital health adoption in oncology.

More on news:

- The collaboration will focus on improving cancer care access and quality, with a **National Cancer Teleconsultation Network to help patients**
- A national tumor biobank and cancer teleconsultation network are among the projects that will be supported by a ₹100 crore contribution towards the **National Cancer Grid (NCG), from Axis Bank**.
- The aim is to improve cancer care and research, in terms of access and digital adoption.

Memorandum of Understanding:

- The bank said it would support the setting up of projects such as the **National Tumor Biobank, National Cancer Teleconsultation Network, and Oncology-specific Electronic Medical Records (EMRs)**.
- This will help standardize systems across the NCG-affiliated centers and help patients who will not need to travel for follow-ups across States.
- The initiatives will also align with the adoption of the Centre's **Ayushman Bharat Digital Mission (ABDM) across the country**.
- It would help establish **Clinical Decision Support Solutions** to standardize cancer care by building evidence based clinical protocols into digital solutions.

Key initiatives:

Improving Cancer Access and Quality:

- The **National Cancer Teleconsultation Network** will be established to help patients diagnosed with cancer to get expert opinions.
- Clinical Decision Support Solutions will standardize cancer care by building evidence based clinical protocols.

Advancing Cancer Research and Innovation:

- **National Tumor Biobank, a central component** of the initiative will establish a repository of tumor tissues, blood, radiology and pathway images with clinical annotation from all over the country.
- A **National Cancer Digital Registry** will emphasize on rare cancer and exceptional responders.

Enabling Digital Capacity Building:

- **Oncology Specific Electronic Medical Records** will be deployed in several NCGnetwork hospitals to enhance clinical data management.
- **Virtual Skills gap** will be set up to reduce skills gap in medical and para medical professionals.

Eliminating diseases, one region at a time

Section: Health

Context:

- The **Carter Center**, a leader in the **global elimination and eradication of diseases**, recently reported that **guinea worm disease** was close to eradication.
- From **3.5 million cases** a year in **21 countries** in **1986**, the number had come down to **13 in five countries** in **2023**, a reduction of **99.99%**. This would be the **second disease** after **smallpox** to be **eradicated** and the **first one with no known medicines or vaccines**.

On disease elimination, its focus

Disease elimination vs. Eradication	<ul style="list-style-type: none"> • Disease elimination focuses on achieving zero transmission within a specified region, contrasting with eradication, which is the permanent global cessation of infection by a pathogen without any risk of reintroduction.
Benefits of disease elimination	<ul style="list-style-type: none"> • Disease elimination enhances public health, particularly for the vulnerable poor, by energizing the health system, improving primary care, diagnostics, and surveillance, and fostering international support. • It also generates significant political, bureaucratic, and public commitment.
Challenges in eliminating a disease	<ul style="list-style-type: none"> • The elimination process is resource-intensive and places a heavy burden on health systems, which could lead to the neglect of other important health functions, especially in weaker health systems. • This necessitates a careful analysis of costs and benefits and requires strong political support.
Strategic Considerations	<ul style="list-style-type: none"> • While scientifically feasible for many diseases, strategic focus should be on pathogens with significant impact and low enough prevalence to make elimination practical. • For diseases with high prevalence, control to reduce their numbers to a feasible level for elimination should be the initial aim. • This strategy helps in understanding elimination processes and costs, and in strengthening health systems for the rigors of elimination.
Need for Robust Surveillance Systems	<ul style="list-style-type: none"> • The government's commitment to disease elimination necessitates substantial investments in surveillance systems to accurately detect every case of the disease. • Even after achieving elimination, ongoing surveillance is critical to promptly identify and address any disease reintroduction, given that the pathogen itself has not been eradicated globally.
Targeted Approaches to Disease Elimination	<ul style="list-style-type: none"> • India, which carries 40% of the global burden of lymphatic filariasis, aims for its elimination as resolved by the World Health Assembly in 1997. • The disease's presence in only a few states suggests that a strategic combination of surveillance, vector control, drug administration, and morbidity management could lead to its elimination.

	<ul style="list-style-type: none"> • Conversely, some diseases with long incubation periods, high prevalence, and drug resistance across many regions require a revised, more localized, and phased approach to elimination. • Diseases that can be feasibly eliminated in defined geographical regions—such as states, districts, or blocks—should be targeted first.
Regional Certification and Expansion Strategy	<ul style="list-style-type: none"> • After achieving elimination and receiving regional certification, such areas should be safeguarded ("ring-fenced") with enhanced control measures in neighboring regions. • This strategy allows adjacent areas to progress towards elimination once they meet the necessary criteria, facilitating a gradual expansion of disease-free zones.

US surgeons have transplanted a pig kidney into a patient

Section: Health

Context:

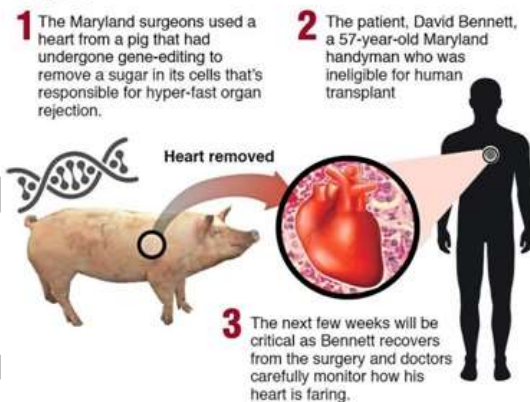
- Doctors in **Boston announced Thursday** they have **transplanted a genetically modified pig kidney** into a 62-year-old patient.

More on news:

- **Massachusetts General Hospital** said it's the **first time a pig kidney** has been transplanted into a living person.
- Previously, **pig kidneys have been temporarily transplanted** into brain-dead donors.
- **Two men received heart transplants** from pigs, although both died within months.
- The announcement marks the latest development in **xenotransplantation, the term for efforts to try to heal human patients with cells, tissues, or organs from animals**.

Pig-to-human heart transplant

In a medical first, doctors transplanted a pig heart into a patient in a last-ditch effort to save his life in a Maryland hospital. While it's too soon to know if the operation really will work, it marks a step in the decades-long quest to one day use animal organs for life-saving transplants.



About Xenotransplantation:

- It is any procedure that involves the transplantation, implantation or infusion into a human recipient of either
 - (a) **live cells, tissues, or organs from a nonhuman animal source, or**
 - (b) **human body fluids, cells, tissues or organs that have had ex vivo contact with live nonhuman animal cells, tissues or organs.**
- The **development of xenotransplantation** is, in part, driven by the fact that the demand for human organs for clinical transplantation far exceeds the supply.

Trials on for seven weight-loss drugs knocking on Indian doors

Section: Health

Context:

- Regulatory data analyzed by **The Indian Express** shows that advanced-stage trials for at least seven new drugs in this category have been listed with India's clinical trial registry.

More on news:

- Studies have proved that the new category of weight-loss injectables can reduce your weight by up to **20% comparable to life-saving bariatric surgeries** — **these are now expected to be available in India in the next couple of years.**
- Currently, there are **31 trials in place.**
- Two of these medications are already approved for use among **diabetics and those struggling with obesity in the US.**
- Six of the seven therapies currently under trial have been developed by **Novo**

Nordisk, a Danish company, and Eli Lilly, a US drug manufacturer.

- These drugs are expected to be **marketed in India once trials show positive results among the population.**
- India is also participating in trials of more potent compounds.

More about drugs:

- Novo Nordisk sells Semaglutide** (antidiabetic and weight-loss medication) as Ozempic, a low-dose injectable for diabetes, and Wegovy, a high-dose injectable for weight loss.
- Eli Lilly has rolled out **Manjaro for managing diabetes and Zepbound for weight loss.**
- Semaglutide essentially mimics a hormone called **glucagon-like peptide 1 (GLP1), which stimulates the pancreas to produce more insulin.**
- This in turn lowers **blood sugar, reducing craving and slowing digestion.**
- All these mechanisms keep you from overeating, ultimately leading to weight loss.
- Tirzepatide, which acts on **two targets (GLP-1 and GIP) is more powerful and leads to about 15% weight loss.**
- Retatrutide, an upcoming drug, acts on **three targets (GLP-1, GIP and glucagon), tackling obesity more effectively at 24%.**
- Novo Nordisk recently announced early results for another weight-loss medicine called Amycretin, which, like **CagriSema, targets GLP-1 and a hormone called amylin.**
- Novo Nordisk is also conducting trials of Semaglutide with insulin Icodec and weight-loss compound Cagrilintide, with Indian participants.**
- Companies like Sun Pharma, **Levim and Biocon sought permission to conduct bioequivalence studies for Liraglutide** last year, firms like Torrent and Dr Reddy's are conducting similar trials for Semaglutide injectables.

Activist write to pm highlighting shortage of vital anti-TB drug

Section: Health

About the news: Activist, Public health experts and survivors wrote a letter PM ahead of **World tuberculosis day (24th March)** request urgent intervention to address the **shortage of Anti-TB Drug**

- Letter also highlight shortage of drug essential for treating drug sensitive (DS-TB)
- Till february shortage of 1st line **Drug Isoniazid, Rifampicin, Pyrazinamide, Ethambutol drugs**

Why Shortage of Drug: Unavailability due to lack of demand in the open market

How Shortage will Impact India:

- Highest burden of TB in the world and shortage of critically required drug affects to treat patient
- According to Nationally TB Elimination Program (NTEP) uninterrupted supply of quality drug is essential for Directly observed Therapy Short Course (DOTS)
- Inadequate access to quality TB Drug may cause emergence of **Drug Resistance variety of TB strain** which is very difficult and costly to treat
- This Shortage Poses a significant risk to the survivor of Multidrug Resistant TB
- Affects treatment outcomes like India pledge to eliminate TB by 2025

TB Burden of India as per global TB report 2023:

- Highest burden of TB in the world 2.8 million that is 27% of TB burden
- Case fatality ratio 12% (out of 100 TB cases 12 case resulted into death)
- India having 1.1 lakh of Multidrug TB (MDR-TB)

Step Taken by India to tackle TB problem:

1. **PM TB Mukht Bharat Abhiyaan:** To bring together all community stakeholder to support those on TB treatment and accelerate the country progress towards TB elimination
2. **New Drug like Bedaquiline and Delamanid** made available for treatment of Drug resistant TB
3. **National TB Control Program:** Anti-TB Drug are procured and supplied to various states and then distributes to various states
4. **Nikshay Poshan:** Direct benefit transfer of Rs 500 to TB patient/month for nutrition
5. **Universal drug susceptibility test** to ensure every diagnosed TB patient is tested to ruled out drug resistance

Different Type of TB

1. **Multidrug Resistance TB (MDR-TB) :** TB which is resistance to 1st line anti-TB drug, it is developed when course of antibiotics is interrupted and can be treated with second line antibiotics Drug
2. **Extensive Drug Resistance TB (XDR-TB):**Caused by strain that is resistance to both firstline and second line antibiotics
3. **Totally Drug Resistant TB (TDR-TB):**It is a form of Tuberculosis which is resistant to all currently used drug

Anaemia prevalence in eight states found to be overstated

Section: Health

Why in news: Study across 8 states found that prevalence of Anaemia has been overestimated by previous National family Health survey (NFHS-5)

More about News:

- NFHS Survey measured the **hemoglobin using finger prick based capillary blood**, these methods underestimate the true blood cells count in capillary blood than **venous blood methods**
- This lower reading of Haemoglobin due to tissue fluid get mixed with capillary blood while drawing the blood samples leading to dilution thus lower reading of Haemoglobin

The World Health Organization recommends **haemoglobin**, a protein responsible for transporting oxygen in the blood, as the biomarker to assess population-based prevalence estimates of anaemia (WHO 2017).

Haemoglobin is assessed in a whole blood sample using either venous or capillary blood. Venous blood samples are collected from a vein, usually from the inside of the elbow or the back of the hand. **Capillary blood samples are collected by pricking the skin of the finger or heel.** **Venous blood is the gold standard source of blood;** however, until recently, capillary blood haemoglobin had been considered an accurate and reliable measure in field settings.



Finding of study:

Assam is highest Anaemia prevalence 69% (78.3% Women) and lowest Meghalaya 12.1 % (14.6% for women)
The Iron Deficiency for whole group was just **18.4%** , **only 25% of women anaemic women(42%)** have iron deficiency

Biased in treatment :

- Though anaemia is caused by multiple factors like **vitamin B 12** and **folate deficiency** and inflammation
- But it is generally believed Iron deficiency as cause of anaemia so focus primarily on treatment of iron deficiency
- Danger of excess iron intake cause oxidative stress on all organs as it is not easy to excrete

Way forward:

- Focus should be on reducing inflammation by consumption of fruits and vegetables
- Diversifying diets to improve intake of all nutrients

- With climate change the nutritional content in cereal decline so we need to diversify from cereal to millets

Anaemia Mukd Bharat

Anaemia Mukd Bharat strategy is focused on benefitting six target beneficiary groups, through six interventions and six institutional mechanisms to achieve the envisaged target of anaemia reduction under the POSHAN Abhiyaan.

Key highlights of the strategy

- Provision of supervised biweekly iron-folic acid(IFA) supplementation by the ASHA for all under-five children
- Weekly IFA supplementation for 5-10 years old children
- Annual/biannual deworming (children and adolescents)
- Point of care testing(POCT) and treatment for in-school adolescents and pregnant women using newer technologies
- Establishing institutional mechanisms for advanced research in anaemia
- Addressing non-nutritional causes of anaemia and
- Setting a comprehensive communication strategy including mass/mid media/social media communication material (radio and TV spots, posters, job-aids, interpersonal communication material

To curb illegal trade, the health ministry tell states to plug gaps in compiling data on organ donors

Section: Health

Why in the news? Union health minister expressed concern over some states not compiling data on living and deceased donors which are essential to monitor the implementation of organ transplantation programs and prevent commercial exploitation of organs

Ministry of Health Advisory:

- All registered or licenced transplant hospitals to get linked with the NOTTO web portal
- Every transplanting hospital needed to register patient requiring transplants in demography format as in the NOTTO portal and update their status
- Data need to be updated regular basis and monthly offline reports of deceased and living donors are required to be provided to NOTTO
- State-appropriate authority given civil court power to ensure compliance with the provision of data

Organ Donation Architecture of India:

- Transplantation of **Human Organs and Tissue Act (THOTA) 1994** which establishes the **National Organs and Tissue Transplant Organisation (NOTTO)**
- **NOTTO** is an apex organization to provides an efficient and organized system of organ procurement, and distribution and maintains the national registry of donors and recipients of organs and tissue
- Hospitals carrying out organs and tissue transplantation, retrieval or tissue banking were required to link NOTTO and provide all data to for national registry

Data of organ donation:

- A total of 16,0041 organs were transplanted in 2022
- mostly Kidney and liver harvest
- Delhi topped the list with 3828 organ transplantations

Way forward:

- Every transplant hospital needs to promote deceased organ donation to achieve a minimum number of donations annually
- Deceased organ donation program to encourage organ donation from deceased individuals
- Taking help of religious leader to remove misconception of organ donation and promoting compassion aspects of organ donation

Bharat biotech commences clinical trials of Spanish tuberculosis vaccine in India

Section: Health

Why in news?

Bharat Biotech will conduct phase 3 of the trial to evaluate the safety and immunogenicity of the Spanish TB vaccine (MTBVAC)

More about MTBVAC:

1. MTBVAC is the only vaccine undergoing clinical trial based on the genetically modified form of mycobacterium tuberculosis, a pathogen that causes disease
2. The new vaccine contains all the antigens in the present strains that infect human

3. MTBVAC vaccine promised to be a more effective and potentially longer-lasting vaccine than the BCG vaccine
4. Promise vaccine for newborns, adults, and adolescents for whom there is currently no effective vaccine

About BCG vaccine:

- BCG vaccine is an attenuated variant of bovine TB pathogen and more than a 100 year old so have limited effect on pulmonary tuberculosis that responsible for the transmission of the disease

Hepatitis B is a public health concern in India; but very few know about its transmission, effects & vaccination

Section: Health

Context:

- A study by Sir Ganga Ram Hospital, New Delhi, revealed that **public knowledge** about **Hepatitis B** is significantly **lacking in India**, with **only 25% of respondents** possessing adequate knowledge about the disease. This includes understanding its **transmission methods, effects on the liver, and the importance of vaccination.**

Disparities in Vaccination Uptake:

- The study identified disparities in **vaccination uptake** influenced by **gender, education levels, and the urban-rural divide.**
- These disparities underscore the need for **increased vaccination efforts** and making these initiatives accessible to all population segments, especially those most at risk.

Hepatitis B Virus (HBV) Infection:

- **Hepatitis B** is an infection in the **liver** which happens because of the **Hepatitis B virus** or **HBV.**
- The **virus** usually spreads through **blood, semen or other body fluids.**
- **HBV** is a major health concern **globally and nationally**, affecting **approximately 296 million people** and resulting in around **887,000 deaths annually** due to complications like **end-stage liver cirrhosis and liver cancer.**
- Despite the availability of an **effective vaccine** for over 30 years, **infection rates remain high**, particularly in countries with **lower socio-demographic indices** like **India.**

Symptoms:

- The most common symptoms of **Hepatitis B** are **jaundice, fever, fatigue** that lasts for weeks or even months, vomiting, loss of appetite, and pain in joints or belly.
- When it is **acute**, the virus lasts a small time and doesn't always necessarily need treatments although it can get serious and lead to life-threatening diseases like organ scarring, liver failure and even cancer.

Prevention:

- It can be prevented or protected against through vaccination.

Type of Hepatitis

virus	A	B	C	D	E
Source of	feces	blood/ blood-derived body fluids	blood/ blood-derived body fluids	blood/ blood-derived body fluids	feces
Route of transmission	fecal-oral	percutaneous permucosal	percutaneous permucosal	percutaneous permucosal	fecal-oral
Chronic infection	no	yes	yes	yes	no
Prevention	pre/post- exposure immunization	pre/post- exposure immunization	blood donor screening; risk behavior modification	risk behavior modification	ensure safe drinking water

Inaccessibility and cost cripple efforts to treat sickle cell disease

Section: Health and Disease

Sickle Cell Disease (SCD):

- It is a significant **genetic disorder** characterized by the **production of abnormally shaped red blood cells**, resembling a **sickle**.
- This disorder leads to various complications, including **severe pain, anaemia, organ damage**, and a **shortened lifespan**.
- **India ranks third globally** in the **number of SCD births**, with a significant number of cases found in **tribal communities**.

Details:

- The **2023 Guidelines for the National Programme for Prevention and Management of Sickle Cell Disease'** reveal that **out of 1.13 crore individuals** screened across different states in **India**, about **9.96 lakh (8.75%) tested positive** for **SCD**. This **high prevalence** highlights the importance of concerted efforts towards the management and prevention of this disease.
- **SCD** is recognized as **one of the 21 "specified" disabilities** under the **Rights of Persons with Disabilities Act 2016**, acknowledging the severe impact it has on individuals' lives.
- The **Government of India's 2023 launch** of the **National Sickle Cell Anaemia Elimination Mission** aims to **eradicate Sickle Cell Disease (SCD) by 2047**.

Access to Treatment a Major Issue:

- The **accessibility of essential treatments** such as **hydroxyurea**, which can significantly **alleviate symptoms** and **improve the quality of life** for **SCD patients**, is severely limited.
- This **medication** is supposed to be available at **primary healthcare levels** as per the **National Health Mission's Essential Medicines List** but is often **only found in tertiary-level facilities**.
- **Blood transfusion services**, a **crucial therapy for managing SCD**, are similarly restricted to **district-level facilities**, leaving those in need at **block levels without support**.
- **Families frequently face the burden of arranging for blood replacement units** and **covering the costs of emergency transportation**. Additionally, the **availability of pain management medications** is insufficient across the board.
- **Bone marrow transplantation (BMT)**, another **potential cure for SCD**, remains **largely inaccessible** due to challenges such as **finding matched donors**, the **high costs** associated with **treatment in private facilities**, and **lengthy waiting periods** in **public hospitals**.

Access to and Equity of CRISPR in Treating SCD:

- The advent of **CRISPR gene-editing technology** offers a promising avenue for treating **Sickle Cell Disease (SCD)**.

- The **U.S. FDA** has approved **two gene therapies** for **SCD** for individuals **aged 12 and older: Casgevy and Lyfgenia**.
 - **Casgevy**, a collaborative effort by **Vertex Pharmaceuticals** and **CRISPR Therapeutics**, marks the **first CRISPR-based therapy** approved in the **U.S.**, also gaining approval in the **U.K.** On the other hand, **Lyfgenia** by **Bluebird Bio** employs a **viral vector for modifying blood stem cells**.
- Both therapies involve a **process of collecting a patient's blood stem cells**, modifying them in a **laboratory setting**, and then **using high-dose chemotherapy** to **eliminate the faulty cells in the bone marrow**.
- The **modified cells** are **reintroduced to the patient** through a **hematopoietic stem cell transplant**.
- This **complex treatment process**, which can extend up to a year, necessitates numerous hospital visits.

CRISPR in India:

- The **National Guidelines for Stem Cell Research (2017)** restrict the commercialization of **stem cell therapies to clinical trials** with **exceptions for certain treatments** and **only permit gene editing of stem cells for in-vitro studies**, advocating for a share of financial benefits from **stem cell product commercialization with donors or communities**.
- The **National Guidelines for Gene Therapy Product Development and Clinical Trials (2019)** set the stage for **gene therapy development and clinical trials**, particularly noting **India's commitment** to utilizing **CRISPR** for treating **sickle cell anaemia** through a **five-year project** backed by the **Council of Scientific and Industrial Research**, with significant funding allocated for **2020-2023**, currently in the **pre-clinical phase**.
- Despite these advances, there are calls for the guidelines to incorporate a stronger stance on **health inequity** and **discrimination**, particularly emphasizing the need for **equitable opportunities** for **underserved populations in clinical trials** and future access to therapies.

India TB Report-2024: Missing cases shrinking, 95% got treatment in 2023

Section: Health

Context:

- The gap between the estimated number and actual cases of **tuberculosis (TB)** is **closing, according to the India TB Report 2024 released by the Union Health ministry**.

More on news:

- This is an important marker as the **“missing cases”** are assumed to not have received treatment, continuing to spread the infection to others.
- There were **only 2.3 lakh missing cases in 2023, as compared to 3.2 lakh** the year before, the report states.
- This gap has been reducing over the years, especially with the **government's Ni-kshay portal tracking all TB patients**.
- Last year, when the in-country model was used to estimate the number of cases and deaths due to tuberculosis, there was a sudden drop in the mortality figures seen in the global report released by the WHO.

Key highlights of the report:

- According to the report, the majority of the **TB cases are still reported by the government health centers, even as there has been an uptick** in notifications by the private sector.
- Nearly **33% or 8.4 lakh of the 25.5 lakh cases reported in 2023 came from the private sector**.
- To compare, **only 1.9 lakh cases were reported by the private sector in 2015**, the year considered to be the baseline by the programme that is geared towards the elimination of the disease.
- The estimated incidence of **TB in 2023 increased slightly to 27.8 lakh from the previous year's estimate of 27.4 lakh**.
- **The mortality due to the infection remained the same at 3.2 lakh as per the data**.
- These estimates are based on a new methodology that India developed and has since been accepted by the World Health Organisation.
- India's TB mortality dropped from **94 lakhs in 2021 to 3.31 lakhs in 2022**.
- The number of cases reported in a year also went down from **4 lakh in 2021 as per the previous method to 27.4 lakh in 2022**, according to the data.
- The report shows that India reached its 2023 target of initiating treatment in **95% of patients diagnosed with the infection**.
- It says **58% of those diagnosed were offered a test to check whether their infection was resistant to the first line drugs, an increase from 25% in 2015**.

About National Tuberculosis Elimination Programme:

- **VISION: TB-Free India with zero deaths, disease and poverty due to tuberculosis**

- **GOAL:** To achieve a rapid decline in burden of **TB, morbidity and mortality while working towards elimination of TB in India by 2025**
- The **National Tuberculosis Elimination Programme (NTEP)**, earlier known as the **Revised National Tuberculosis Control Programme (RNTCP)**, is the **Public Health initiative of the Government of India that organizes its anti-Tuberculosis efforts.**
- It functions as a flagship component of the **National Health Mission (NHM)** and provides **technical and managerial leadership to anti-tuberculosis activities in the country.**
- As per the **National Strategic Plan 2017–25**, the program has a vision of achieving a **"TB free India", with a strategy under the broad themes of "Prevent, Detect, Treat and Build pillars for universal coverage and social protection".**
- The program provides various **free of cost, quality tuberculosis diagnosis and treatment services** across the country through the government health system.

ICMR set to bring in evidence-based norms for lung cancer management

Section: Health

Context:

- **Lung cancer** is a **major health concern in India**, representing **10% of all cancer-related deaths** in the country.
- However, there are **no evidence-based guidelines** for its **prevention, screening, diagnosis, management, or palliation.**

Initiative by the Indian Council of Medical Research (ICMR):

- Recognizing the need for **comprehensive guidelines**, the **ICMR plans to launch systematic reviews and meta-analyses to consolidate existing evidence.**
- This effort **aims to inform clinical practice and enhance patient outcomes in lung cancer management.**
- An **Expression of Interest (EoI)** has been issued to researchers interested in undertaking systematic reviews and meta-analyses on **lung cancer**, focusing on **pre-defined review questions (PICOs).**
- These reviews will **assess the quality of evidence** using the **Grading of Recommendations Assessment, Development, and Evaluation (GRADE) tool**, evaluating the **strength of the evidence** and **informing recommendations** through the **Evidence to Decision (EtD) framework.**
- **Scope and Methodology:**
 - Researchers may be assigned **multiple review questions**, covering areas such as **prevention, screening, and diagnosis.**
 - The **GRADE methodology** will be employed to **systematically assess and grade the evidence** derived from the **reviews**, facilitating the formulation of guidelines.

About Lung Cancer:

- **Lung cancer** is a **malignant tumour** developed in the **lung** which is caused due to **uncontrollable growth of cells within the lung tissues.** There are **two stages** of lung tumour.
 - Non-small cell lung cancer
 - Small cell lung cancer
- The **World Health Organization** highlights **lung cancer** as a **significant public health issue worldwide**, primarily caused by **tobacco smoking.**
- Other risk factors include **second-hand smoke exposure, occupational hazards, air pollution, genetic factors, and pre-existing lung diseases.**
- Conclusion

WHO launches 'CoViNet' — a global laboratory to monitor emerging coronaviruses

Section: Health

CoViNet:

- Launched by the **World Health Organization (WHO).**
- It is a **global network of laboratories aimed at identifying and monitoring emerging coronaviruses** that may **pose future threats**, expanding beyond just **SARS-CoV-2** to include other **coronaviruses like MERS-CoV.**
- It consists of **36 laboratories** from **21 countries** across **all WHO regions.**

- This initiative builds upon **WHO's** previous efforts during the **COVID-19 pandemic** and intends to **bolster laboratory capacities worldwide**, particularly in **low- and middle-income countries**, for the **surveillance of MERS-CoV** and other significant coronaviruses.
- **CoViNet** is designed to enhance **animal health and environmental monitoring**, **perform timely risk assessments**, and **inform WHO policies and protective actions**.
- The **network's action plan** for **2024-2025** was **established** during a meeting in **Geneva, Switzerland**, indicating a **coordinated global response** to the **threats posed by novel coronaviruses**.
- This includes guiding the **WHO's Technical Advisory Groups** on **viral evolution** and **vaccine composition against SARS-CoV-2 mutations and variants**.
- 'Disease X' is a term used by **WHO** for a **hypothetical, unforeseen disease** of significant impact, likely a **zoonotic RNA virus**.

Naturally occurring bile acid can blunt statin-induced diabetes

Section: Health

Context:

- A study from **China** has discovered that **ursodeoxycholic acid (UDCA)** can **counteract the side effect of statins**, which is the **tendency to induce glucose intolerance and diabetes**.

Statins:

- **Statins** are a **class of medications** that **reduce illness and mortality** in people who are at **high risk of cardiovascular disease**. They are the most commonly prescribed **cholesterol-lowering drugs** and are also known as **HMG-CoA reductase inhibitors**.
- **Statins**, widely prescribed to **reduce cardiovascular disease risk** by **lowering LDL (low-density lipoprotein) cholesterol**, have been linked to an **increased diabetes risk** despite their **global prevalence as essential and top-selling medications**.
- **Statins** are on the **World Health Organization's list of essential medicines** and among the **most sold drugs worldwide**.

Mechism behind induced glucose intolerance:

- **Statins** can **induce glucose intolerance** and even **lead to diabetes** in some individuals. Despite these side effects, the benefits of statins are deemed to outweigh the risks, which has kept them in widespread use.
- A study identified a **mechanism behind this effect**, involving the **bile acid UDCA**.
- Researchers observed that **individuals taking atorvastatin** showed a **decrease in Clostridium bacteria** in their faeces and had **altered bile acid profiles** in their serum and faeces, suggesting a potential link to the development of **glucose intolerance**.

Gut microbiome:

- Researchers have uncovered that a **Clostridium-deficient gut microbiome**, influenced by **statins**, may **impair glucose metabolism** by **inhibiting hydroxysteroid dehydrogenases enzymes** and **reducing UDCA levels**.
- This was further explored through a study on mice over 12 weeks, suggesting that **alterations in the gut microbiome** could **affect bile acid synthesis** and **glucose regulation**.
- A human trial with **statin users** given **UDCA** showed **improved HbA1C levels**, indicating better **glucose homeostasis** without affecting **statins' lipid-lowering benefits**.

PM Modi launches hydrogen-powered ferry: features, significance

Section: Msc

Context:

- Prime Minister Narendra Modi Wednesday virtually launched **India's first indigenously developed hydrogen fuel cell ferry**.

More on news:

- Built at a cost of Rs 18 crore, the ferry will be handed over to the Inland Waterways Authority of India by the CSL after rigorous trials.
- The **Ministry of Ports, Shipping and Waterways met 75 per cent of the project cost**.
- The '**Harit Nauka**'(green boat) initiative of the **Ministry of Ports, Shipping and Waterways envisages a green transition of inland vessels**.
- In line with this, the ferry can be replicated in other parts of the country for urban mobility. It is also a boost to the **National Green Hydrogen Mission**.

What are the special features of the vessel?

- The Hydrogen fuel cell vessel is a 24-meter-long catamaran, which can carry 50 people in its air-conditioned passenger area.
- The accommodation area has been constructed with high-quality fiberglass reinforced plastic, similar to metro train coaches.
- **Hydrogen fuel cell vessels do not use conventional batteries as the primary storage house of electrical energy.**
- **The vessels run on hydrogen fuel, which is stored in cylinders.**
- This boat has five hydrogen cylinders that can carry 40 kg of hydrogen and support eight hours of operations.
- The vessel is also fitted with a 3-kW solar panel.
- The hydrogen fuel cell-powered vessel has zero emission, zero noise and is energy-efficient, which makes it more environment-friendly.
- Since there are no moving parts, the ferry requires less maintenance than combustion vessels.

How do hydrogen fuel cells work?

- A hydrogen fuel cell generates electricity by utilizing the chemical energy contained in hydrogen.
- It releases only pure water, not discharging pollutants.
- **Hydrogen is loaded into cells.**
- The energy within the **hydrogen is converted into electricity and heat, which is then used to power the vessel's propulsion mechanism.**
- In the fuel cell, the **hydrogen reacts with the oxygen in the air to produce electricity.**
- Unlike batteries, hydrogen fuel cells do not require recharging.
- Provided uninterrupted supply of fuel and oxygen, these cells would work continuously.

What type of cells have been used in the vessel?

- This vessel uses a **50-kW PEM (proton-exchange membrane) fuel cell**, with **Lithium-Ion Phosphate batteries.**
- The advantage is that the cells can quickly change their output depending upon the power demand.
- PEM fuel cells are popular in automotive applications because they operate at a lower temperature, and are lighter and more compact.

How was it developed?

- India has now **indigenously developed hydrogen fuel cells and their related systems.**
- The vessel has been built completely by the CSL, which also developed the vessel automation system and power management system.
- **The hydrogen fuel cell system was developed by KPIT Technologies, Pune**, in collaboration with the Council of Scientific and Industrial Research Labs, under the Union Ministry of Science and Technology.

What is the Harit Nauka initiative?

- In **January 2024**, the shipping ministry unveiled the **Harit Nauka** guidelines for inland vessels.
- As per the guidelines, **all states have to make efforts to use green fuels for 50 per cent of inland waterways-based passenger fleets in the next one decade, and 100 per cent by 2045.**
- This is to **reduce greenhouse gas emissions** as per the **Maritime Amrit Kaal Vision 2047.**

Bengaluru bomb blast: What are improvised explosive devices, or IEDs?

Section: Msc

Context:

- At least nine people were injured after an explosion at the bustling **Rameshwaram Cafe in Bengaluru's Whitefield** area on March 1, possibly by an **improvised explosive device (IED).**

More on news:

- Some notable instances of IEDs being used in the past include the 1993 Mumbai serial blasts, the 2008 Jaipur blasts, the 2006 Jama Masjid bombings, and the 2013 Bodh Gaya bombings. IEDs have also been commonly used by Maoist insurgents, and Kashmiri militants.

What are IEDs?

- The term "IED" first entered common usage during the United States' Iraq invasion (beginning in 2003), where such bombs were commonly used against US forces.

- An IED is basically a home-made bomb.
- IEDs can come in many forms, ranging from a small pipe bomb to a sophisticated device capable of causing massive damage and loss of life.
- IEDs can be deployed using a vehicle, carried, placed, or thrown by a person, delivered in a package, or concealed on the roadside.

	Common uses	Common form	Known IED use
High explosives			
Ammonium nitrate and fuel oil (ANFO)	Mining and blasting ²	Solid	Oklahoma City bombing
Triacetone Triperoxide (TATP)	No common uses; mixed from other materials	Crystalline solid	2005 bombings in London
Semtex, C-4	Primarily military	Plastic solid	Irish Republican Army bombings
Ethylene glycol dinitrate (EGDN)	Component of low-freezing dynamite	Liquid	Millennium Bomber, intended for Los Angeles airport, 1999
Urea nitrate	Fertilizer	Crystalline solid	World Trade Center 1993
Low explosive			
Smokeless powder	Ammunition	Solid	Olympic Park bombings

Components of an IED:

- Each IED comprises a few basic components, which can come in various forms, depending on resources available to the bomb-maker.
- These include an **initiator or a triggering mechanism, (which sets the explosion off), a switch (which arms the explosive), a main charge (which causes the explosion), a power source (since most IEDs contain an electric initiator, they require an electronic power source), and a container.**
- Additionally, IEDs may be packed with additional materials or “enhancements” such as nails, glass, or metal fragments designed to increase the amount of shrapnel released by the explosion — and thus the damage it causes.
- Enhancement may also include hazardous materials such as toxic chemicals, or radio-active circumstances — **an IED packed with, say, depleted Uranium will be colloquially called a “dirty bomb”.**
- Some common materials used **to build IEDs include fertilizers such as ammonium nitrate and urea nitrate, gunpowder, and hydrogen peroxide.**
- The reasons why passengers are not allowed to carry beyond a certain quantity of liquids aboard commercial aircraft is the possibility of creating IEDs on site by mixing some commonly available liquids.

Damage caused by IEDs:

- IEDs are not simply used to kill and injure — **they have often, especially in active war zones, been used as distractions.**
- The extent of damage caused by an **IED depends on its size, construction, and placement, and whether it incorporates a high explosive or propellant.**
- **Typically, IEDs come with a very clear trade-off.**
- While smaller bombs are easier to hide, carry, and deploy, they are also generally much less damaging than larger ones, especially ones deployed using vehicles.

In snake genes, study finds they evolved 3x faster than other reptiles

Section: Msc

Context:

- In the earth’s distant past, many species went through bursts of evolutionary innovation, taking giant leaps and incorporating extraordinary diversity in their population, while others were left behind.

Unexplained bursts of change:

- The enduring mystery in **evolutionary biology** revolves around **why some species experience sudden, significant evolutionary changes**, known as **quantum leaps**. While the **Darwinian theory** suggests that **evolution occurs gradually through natural selection**, fossil records indicate a more complex narrative.
- These records reveal not only a **constant rate of transformation** but also instances of **rapid evolution**, leading to **new species' emergence** or the **extinction of existing ones**.
- This **discrepancy** between the **slow, incremental changes** proposed by **Darwin** and the **sudden bursts of evolution** documented in the **fossil record** highlights the complexity and variability of evolutionary processes on Earth.

A tree of snakes and lizards:

- Approximately **100-150 million years ago**, during the era when **dinosaurs inhabited the Earth**, a significant **evolutionary event** occurred leading to the **transformation of ordinary lizards into snakes**, now considered some of the most highly adapted predators globally.
- This transition involved the **loss of legs**, enabling snakes to navigate various terrains effortlessly.
- **Snakes** also developed **intricate chemical sensory systems** for **tracking prey**, **flexible jaws** capable of **consuming large animals**, and **diverse methods of attack**, including **venom production**.

Study findings:

- A recent study, published in the journal Science on February 22, conducted by an international team with leading researchers from the University of Michigan, **aimed to decipher the genetic sequence of over 1,018 snake and lizard species**.
 - This effort resulted in the creation of the **most extensive and detailed evolutionary tree of snakes and lizards** to date.
 - By combining **new genetic data** with **previous studies**, the research uncovered that **snakes have been evolving at a rate nearly three times faster than lizards and other reptiles**.
 - This rapid evolution allowed snakes to **exploit new environmental niches** that appeared following the **dinosaurs' extinction**, contributing significantly to their diversification and success across the globe.

A clock in the body's molecule:

- The concept of a **molecular clock** is based on the observation that **DNA and protein sequences** evolve at a relatively **constant rate over time**, regardless of the species. This consistency allows scientists to **use genetic variations between two species to estimate the time elapsed since their last common ancestor**, providing insights into the pace of their evolution.
- Essentially, **genetic sequences** act as a **molecular clock**, enabling the determination of '**evolutionary distances**' between **different organisms**.
- This mechanism has revealed not only the **rapid evolution of snakes** but also **similar adaptations in many lizards**, which developed **snake-like features** such as **limb loss and body elongation**.
- The **Australian scincoid lizard (Lerista)**, part of the **Squamata clade** (which includes both lizards and snakes), exemplifies this evolutionary trend.
- **Lerista** shows a remarkable range of **limb configurations** across its more than 75 species, from **full-limbed to completely limbless**, due to at least 10 separate limb-reduction events over millions of years.
- However, despite these adaptations, **snakes have evolved much faster than lizards**, leading to a significant diversification known as the "**singularity of snakes**".
- This concept is likened to the **Big Bang theory** in cosmology, suggesting that **snakes underwent a series of rapid evolutionary changes** that, although distinct, occurred so closely together in time that they appeared as a single, transformative event in evolutionary history.

Availability of prey:

- The current diversity of snakes, with approximately **4,000 species** thriving in various habitats—including on **land, in trees, underground**, and in **water**—can be attributed to their **adaptability** and **varied hunting strategies and diets**.
- A recent comprehensive study involving the analysis of **stomach contents** from over **60,000 snakes and lizards** revealed that **snakes primarily consume small vertebrates**, demonstrating a **specialization in their dietary preferences**, while **lizards generally eat insects and invertebrates**, indicating a **less specific diet**.
- However, the diversity of snakes cannot be solely explained by the availability of prey. The underlying cause of the evolutionary "**singularity**" that led to the **rapid diversification of snakes remains elusive**.
- A significant aspect of **snake evolution** involves their **unique mode of movement**, facilitated by their **elongated spinal column** and **specialized vertebrae**, which allow for efficient **gliding**.

- Despite having a **similar genetic blueprint to lizards and humans**, snakes possess over **300 vertebrae**, **significantly more than their counterparts**.
- This **morphological distinction** is partly due to variations in the **Sonic hedgehog gene**, a **critical gene in limb development**.
- Previous research has identified **snake-specific changes in a limb-enhancer of this gene**, which is present in **primitive snakes** like **pythons** and **boas** but not in modern snakes.
- Experiments replacing the **limb-enhancer gene** in mice with the **snake-specific version** resulted in **severe limb reduction in the mice**.
- This finding suggests that such evolutionary developments could have occurred multiple times, not just once.
- Understanding these **evolutionary bursts** is crucial for comprehending the **Earth's ecological future**.

Resonance: a tendency to move in step

Section: Msc

Resonance:

- **Resonance** occurs when a system **oscillates with greater amplitude** at its natural frequency, the frequency at which it tends to vibrate in the absence of external disturbances.
- This phenomenon, akin to the enhanced vibration of a drum membrane when struck, is **observed both in nature and in man-made systems**.
 - An **example of resonance** is when **pushing a swing**; the most effective push aligns with the **swing's existing oscillation frequency, maximizing the swing's motion**.
- **Resonance** can have both **positive** and **negative effects**.
- It is beneficial in various applications, such as **ensuring the accuracy of quartz watches, enhancing musical performances, generating laser light, and facilitating detailed internal body imaging through MRI scanners**, which rely on **nuclear magnetic resonance**.
- However, **resonance** can also have **undesirable consequences**, such as when the **vibration of a bus's engine at idle causes the vehicle's structure to rattle uncomfortably**.
 - A historical instance of resonance's destructive potential occurred on April 12, 1831, with the **collapse of the Broughton Suspension Bridge in England**.
 - The **synchronized marching of British soldiers** produced a **periodic force that matched the bridge's natural frequency**, leading to its **failure**.
 - This incident led to the **practice of soldiers breaking step when crossing bridges to prevent similar accidents**.

Significance of Lab-Grown Diamonds in Power Electronics

Section: Msc

Traditional Use: Lab-grown diamonds, apart from being **used in jewellery**, are also utilized in industries, particularly for **cutting purposes**.

New Application: A new **application for synthetic diamonds** is emerging in the field of **power electronics**, specifically for **heat dissipation**.

Need for Effective Heat Dissipation:

- **Power Density Increase:** Power electronic components tend to **heat up as their power density increases**.
- **Traditional Cooling:** Copper has traditionally been used to dissipate heat in power electronics. However, **to prevent interference with electricity, a thin layer of insulating material is placed around the copper**.
- **Challenge:** The challenge arises because **good insulators are typically poor conductors of heat**. Therefore, a material is needed that can efficiently conduct heat while maintaining electrical insulation.

Role of Diamond in Heat Dissipation:

- **Ideal Material:** Diamond possesses the qualities needed for this task. It is **electrically insulating but highly thermally conductive**, making it ideal for electronic cooling applications.
- **Heat Conductivity:** The **heat conductivity of diamond is approximately five times that of copper**, making it an excellent choice for dissipating heat in power electronics.

Research and Development:

- **Previous Studies:** In 2022, researchers from China and Israel conducted a study on the **cooling enhancement of a cold plate made of single-crystal diamond (SCD)** with embedded microfluidic channels.
- **Results:** Their findings indicated that the **cold plate made of SCD exhibited significantly enhanced cooling effects**, especially for high applied power densities and flow rates.
- **Fabrication Challenges:** One practical challenge faced in **using diamonds for cooling is how to fabricate extremely thin sheets of diamonds** for integration into electronic components.

Development of Diamond Nanomembranes:

- **Fraunhofer USA Inc, Center Midwest CMW:** Scientists at this center in Michigan have developed nanomembranes made from synthetic diamonds.
- **Thin and Flexible:** These **nanomembranes are thinner than a human hair and are flexible**, making them suitable for integration into electronic components.
- **Cooling Efficiency:** The nanomembranes have the potential to **reduce the local heat load of electronic components**, such as current regulators in electric motors, by a factor of ten.
- **Benefits for Electric Cars:** The use of these nanomembranes can significantly **improve the energy efficiency, service life, and performance of electric cars**.

Dr. Matthias Mühle's Comments:

- **Replacing Intermediate Layers:** Mentions of the **goal of replacing intermediate layers in electronic components with diamond nanomembranes**.
- **Conductive Paths:** Diamonds can be processed into conductive paths, **making them versatile for various applications within electronic components**.
- **Integration:** The flexibility of the nanomembranes allows them to be positioned anywhere on the component, **integrated directly into the cooling circuit, or used alongside copper elements**.

In summary, the use of lab-grown diamonds, particularly in the form of nanomembranes, shows promising advancements in the field of power electronics. **These developments have the potential to significantly enhance the cooling efficiency and performance of electronic components, particularly in applications such as electric cars.**

About Lab-Grown Diamonds: A Technological Marvel

- Lab-grown diamonds are **created using advanced technology that replicates the geological processes responsible for the formation of natural diamonds**.
- These diamonds are **distinct from diamond simulants** like Moissanite, Cubic Zirconia (CZ), White Sapphire, and YAG, which are **used to mimic the appearance of natural diamonds**.

Production Methods:

High Pressure, High Temperature (HPHT) Method:

- **Description:**
 - This method is the most common and cost-effective.
 - Involves **subjecting a "diamond seed" (often graphite) to extreme pressure and temperatures**.
- **Process:**
 - Heavy presses generate pressures of up to 730,000 psi.
 - Temperatures exceed 1500 degrees Celsius.
 - Under these conditions, the **carbon transforms into diamond**.
- **Outcome:**
 - Results in the **creation of diamonds from relatively inexpensive carbon sources**.

Chemical Vapor Deposition (CVD) Method:

- **Description:**
 - This method **involves the deposition of carbon atoms onto a substrate to form diamond**.
- **Process:**
 - A "diamond seed" substrate is placed in a chamber filled with a carbon-rich gas.
 - When heated, carbon atoms adhere to the seed, gradually forming a diamond.
- **Outcome:**
 - Produces **high-quality diamonds suitable for various applications**.

Explosive Formation:

- **Description:**
 - Also known as detonation nano diamonds.
 - Created through explosive processes that **transform carbon materials into diamond.**
- **Process:**
 - Controlled **detonations convert carbon into diamond particles.**
- **Outcome:**
 - **Yields Nano diamonds with unique properties used in specialized applications.**

Applications of Lab-Grown Diamonds:

- **Industrial Uses:**
 - LGDs are **widely employed in industrial settings due to their exceptional hardness** and strength.
 - Ideal for **machinery components, cutting tools, and abrasives.**
- **Electronics:**
 - Pure synthetic diamonds are utilized as **efficient heat spreaders in electronic devices.**
 - Applications include **high-power laser diodes, laser arrays, and high-power transistors.**
 - The exceptional **thermal conductivity of diamonds helps dissipate heat effectively.**

Advantages of Lab-Grown Diamonds:

- **Sustainability:**
 - Offers a sustainable alternative to mined diamonds, reducing the environmental impact.
- **Durability:**
 - Possess the **same hardness and durability as natural diamonds**, suitable for diverse applications.
- **Precision Engineering:**
 - The controlled production process ensures consistent quality and purity of LGDs.
- **Technological Advancements:**
 - Continual improvements in **production techniques enhance the properties and applications of lab-grown diamonds.**

India's Diamond Industry Scenario:

- **Global Leader:** India leads the world in diamond cutting and polishing, accounting for over 90% of global polished diamond manufacturing.
- **Key Hub:** Surat, Gujarat, is a renowned global center for diamond manufacturing.
- **Market Insights:** The US stands as the largest market for cut and polished diamonds, followed closely by China.
- **Export Contribution:** India contributes 19% of the world's total diamond exports, showcasing its significant role in the global market.

Government Initiatives to Promote LGDs:

- **Customs Duty Reduction:**
 - The Union Budget 2023 **aims to reduce the basic customs duty on seeds used in LGD manufacturing.**
 - The duty on seeds for **rough LGDs will be slashed from 5% to nil**, encouraging local production.
- **Research and Development:**
 - A five-year **research grant will be awarded to an Indian Institute of Technology (IIT) for LGD-related research and development.**
- **Creation of Tariff Lines:**
 - New tariff lines will be **established to aid in identifying various products, including synthetic diamonds.**
 - This move aims to **facilitate trade and provide clarity on availing concessional import duty, promoting the growth of LGD industry in India.**

The emphasis on Laboratory-Grown Diamonds in the Union Budget 2023 **underscores India's commitment to innovation, sustainability, and growth in the diamond industry, aligning with global trends towards environmentally friendly and efficient practices.**

What is 'dry ice' at the centre of the Gurugram restaurant incident?

Section: Msc

Context:

- At a Gurugram restaurant, the diners were mistakenly given "dry ice" as a **mouth freshener**, leading to **severe health reactions** including **vomiting blood**.

Dry ice:

- **Dry ice** is the **solid form of carbon dioxide**, recognized by **authoritative bodies** such as the **Food Safety and Standards Authority of India (FSSAI)**, the **United States Food and Drug Administration (FDA)**, and the **Centers for Disease Control and Prevention (CDC)** as a **hazardous substance**.
- **Direct contact with skin or ingestion** can lead to **significant harm** to both **skin and internal organs** due to its **extremely cold temperatures** and the **risk of sublimation** into **carbon dioxide gas**, potentially **causing breathlessness**.

Primary Use:

- Primarily utilized as a **cooling agent for food products**, dry ice is favoured for its **ability to maintain lower temperatures than water ice** and for **leaving no residue**, other than **incidental frost**.
- It finds applications in **preserving frozen foods** where **conventional mechanical cooling is impractical**.
- Additionally, **dry ice is employed in fog machines** for theatrical effects and other applications requiring temporary refrigeration.

Characteristics:

- **Sublimates** at **194.7 K** ($-78.5\text{ }^{\circ}\text{C}$; $-109.2\text{ }^{\circ}\text{F}$) under **Earth's atmospheric pressure**.
- Can lead to **hypercapnia** if it **outgasses in confined spaces**.

Safe Handling Guidelines:

- **Awareness campaigns** are necessary to educate food business operators and citizens on the proper and **safe handling of dry ice**.
- **FSSAI** warns against **storing dry ice in enclosed spaces** and **underscores the need for well-ventilated areas** to mitigate health risks.
- The **FDA** emphasizes that dry ice should not compromise food safety and advises against its direct consumption or skin contact.
 - Establishments using **dry ice** should **implement safety procedures and employee training** to prevent accidental ingestion or contact, according to the FDA.
- The **CDC** recommends using gloves designed for cold temperatures, safety goggles, and working in well-ventilated areas to handle dry ice safely, strictly advising against its consumption.

12 security agencies to use indigenously developed explosive detectors

Section: Msc

Context:

- Two indigenously developed explosive detectors have been handed over to the Intelligence Bureau for field deployment by 12 identified security agencies across the country.

More on news:

- The move is expected to further strengthen the apparatus of the security forces.
- The **Electronics Corporation of India Limited (ECIL)**, the **Department of Atomic Energy (DAE)** and the **Defence Research and Development Organisation (DRDO)** have developed the explosive detectors for security forces.

About the detectors:

- The detectors, based on **Ion Mobility Spectrometry (IMS)** technique and Raman Backscattering (RBS) principle respectively, have been customized as per specific requirements of the agencies, as part of a development project initiated at the behest of IB in 2017.
- The user agencies have been asked to provide feedback about the field deployment experience of the 2 detectors so that further improvements, if required, can be made.

In Gujarat, harnessing the value of dung to boost farmers' income

Section: Msc

Context:

- **Gujarat's dairy cooperatives** are showing the way in supplementing their farmers' income from milk by procuring **dung and converting it into Bio CNG and fertilizer.**

More on news:

- **Deesa-Tharad highway in Gujarat's Banaskantha district**, catering to 90-100 vehicles daily, is India's first and only gas-filling station based on dung from cattle and buffaloes.

Dung facts

- From 40 tonnes of dung, we get 2,000 cubic meters of raw biogas containing **55-60% methane, 35-45% CO₂, and 1-2% hydrogen sulfide (H₂S) and moisture**

About Biogas plant:

- A biogas plant requires fresh dung, which contains **methane along with water.**
- The methane is produced by bovines inside their **rumen (first of four stomach compartments), where the plant material they eat gets fermented or broken down by microorganisms before further digestion.**
- **Carbohydrate fermentation leads to production of carbon-dioxide (CO₂) and hydrogen.**
- These are used by **archaea (bacteria-like microbes in the rumen) to produce methane**, which the animal expels either as gas or in the dung.
- The dung left to dry in the open releases both **water and methane.**
- To realize its fuel value, the dung has to, therefore, be collected and delivered in fresh form at the biogas plant.

Fuel plus fertilizer:

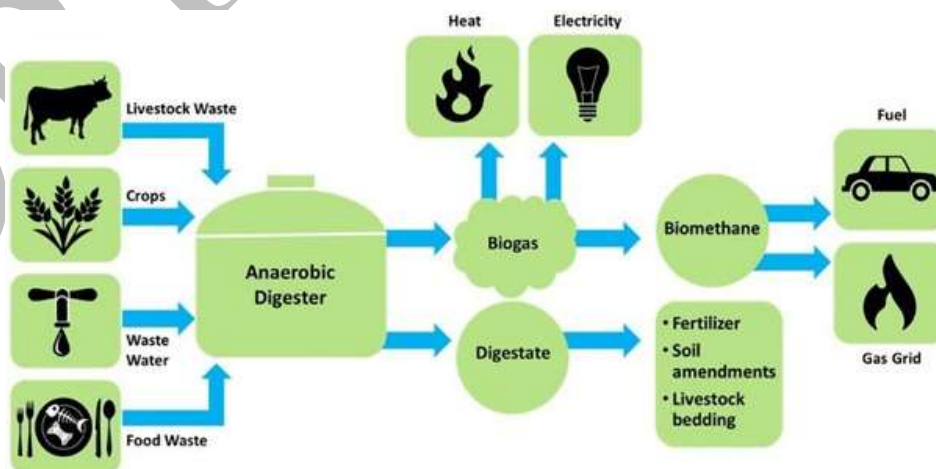
- The raw dung unloaded at the BioCNG plant is mixed with an equal quantity of water. The resultant slurry is then pumped into an anaerobic digester.
- **Anaerobic digestion is a process by which the complex organic matter in dung is broken down in the absence of oxygen to produce biogas**

The digestion involves four successive stages:

- **hydrolysis (break-down of organic matter into simple molecules),**
- **acidogenesis (their conversion into volatile fatty acids),**
- **acetogenesis (production of acetic acid, CO₂ and hydrogen) and**
- **methanogenesis (biogas generation).**

What is Biogas?

- It mainly comprises hydro-carbon which is combustible and can produce heat and energy when burnt.
- Biogas is produced through a biochemical process in which certain types of bacteria convert the biological wastes into useful bio-gas.
- Since the useful gas originates from a biological process, it has been termed as bio-gas.
- **Methane gas is the main constituent of biogas.**



Purification of Biogas:

- The raw gas is purified for removing **CO₂** (through vacuum pressure swing adsorption or VPSA process), **H₂S** (using activated carbon filter) and moisture (with air dryer separator).
- The end-product, **purified (to 96-97% methane, 2-3% CO₂ and below 0.1% H₂S and moisture) and compressed, is stored in cascades.**
- This **compressed biogas (CBG)**, conveyed through pipelines to the dispensers at the fuel station, is what's being sold as **BioCNG at Rs 72/kg.**

Specialized Cylinders for Hydrogen Storage

Section: Msc

The Ministry of New and Renewable Energy (MNRE) plans to convene a meeting with relevant stakeholders to discuss the **development of specialized cylinders for green hydrogen storage.**

Background and Challenges:

- **Commercial Vehicle Manufacturers Concerns:** Manufacturers of commercial vehicles, including heavy-duty and long-haul trucks, have raised concerns about challenges related to **high-pressure storage cylinders in adopting green hydrogen as a sustainable fuel.**
- **Cost Challenges:** High-cost factors associated with green hydrogen fuel cells

Types of Cylinders:

- **Categorization:** Gas cylinders are categorized into four types based on the materials used.
- **Suitability for Hydrogen:** *Type 1 and Type 2 cylinders are suitable for storage, while Type 3 is preferred for storage and transportation. Type 4 cylinders are recommended for onboard storage.*
- **Pressure Differences:** Hydrogen is stored at a much higher pressure compared to compressed natural gas (CNG). **Hydrogen storage pressure ranges between 5,000-10,000 psi.**

Meeting Discussions and Plans:

- MNRE aims to hold a meeting with industry stakeholders to **develop Type 3 and Type 4 cylinders to address challenges related to high-pressure hydrogen storage.**
- **Carbon Fiber Reinforcement:** Type 3 and Type 4 cylinders are **reinforced with carbon fiber, making them lightweight and suitable for use in vehicles.**
- **Manufacturing Challenges:** Manufacturing high-pressure Type 4 hydrogen cylinders involves a **slightly more complex process compared to CNG cylinders, adding to production costs.**
- **Domestic Companies' Plans:** Companies like Confidence Petroleum India Limited, Time Technoplast Limited, INOX India Limited, and Indoruss Synergy Private Limited are planning to manufacture Type 4 cylinders for hydrogen storage.
- **BHEL's Initiatives:** Bharat Heavy Electricals Limited (BHEL) is working on setting up a Center of Excellence for hydrogen storage cylinders and fuel cell technologies in collaboration with the Ministry of Heavy Industries.
- **OEM Concerns:** Original Equipment Manufacturers (OEMs) such as Volvo Eicher, Ashok Leyland, and Tata Motors **flagged concerns about the high cost of hydrogen fuel cells.**
- **Bosch's Developments:** Bosch, a company that started volume production of fuel cell modules in 2023, is **developing hydrogen combustion engines for retrofitting diesel buses and trucks.**

Conclusion:

The meeting with MNRE and stakeholders aims to address **challenges related to high-pressure hydrogen storage cylinders.** The development of Type 3 and Type 4 cylinders is crucial for the adoption of **green hydrogen as a sustainable fuel** in the transport sector. Domestic companies and OEMs are actively involved in developing technologies and manufacturing cylinders for hydrogen storage, indicating a growing interest in hydrogen-powered vehicles for the clean energy transition.

National Green Hydrogen Mission

The National Green Hydrogen Mission in India is a significant initiative aimed at **positioning the country as a global leader in the production, use, and export of green hydrogen.**

Objectives:

1. **Development of Green Hydrogen Production Capacity:**
 - Target of producing at least 5 Million Metric Tonnes (MMT) per annum of green hydrogen.
2. **Renewable Energy Capacity Addition:**
 - Addition of about 125 Gigawatts (GW) of renewable energy capacity in the country by 2030.
3. **Total Investments:**

- Expectation of over 8 lakh crores in total investments.
- 4. **Job Creation:**
 - Creation of over 6 lakh jobs by 2030.
- 5. **Reduction in Fossil Fuel Import:**
 - Saving over 1 lakh crore in fossil fuel imports.
- 6. **Greenhouse Gas Emissions Reduction:**
 - Reduction in **about 50 MMT of annual greenhouse gas emissions by 2030.**

Components of the Mission:

1. **SIGHT (Strategic Interventions for Green Hydrogen Transition Programme):**
 - Financial incentives for:
 - Domestic manufacturing of electrolysers.
 - Production of green hydrogen.
2. **Strategic Hydrogen Innovation Partnership (SHIP):**
 - Public-private partnership framework for research and development (R&D).
3. **Green Hydrogen Hubs:**
 - Identification and development of **regions capable of supporting large-scale hydrogen production and utilization.**
4. **Policy Framework:**
 - Development of an enabling policy framework to support the establishment of the green hydrogen ecosystem.
5. **Standards and Regulations:**
 - Framework for developing standards and regulations.
6. **Skill Development Programme:**
 - Coordinated skill development programme.
7. **Pilot Projects:**
 - Support for pilot projects in emerging end-use sectors and production pathways.

India's Current Status for Green Hydrogen:

1. **Initiatives:**
 - Commissioning of **India's first 99% pure green hydrogen plant by Oil India Limited in Jorhat, Assam.**
 - India's first Green Hydrogen Blending operation in the **Piped Natural Gas (PNG) Network by NTPC in Kawas, Surat.**
 - Approval for **5% blending of green hydrogen with PNG** (to be scaled to 20%) by Petroleum and Natural Gas Regulatory Board (PNGRB).
 - Collaboration between Pune Municipal Corporation (PMC) and The Green Billions (TGBL) for the **waste-to-hydrogen project.**

Benefits of the Mission:

1. **Export Opportunities:**
 - Creation of export opportunities for green hydrogen and its derivatives.
2. **Decarbonization:**
 - Decarbonization of industrial, mobility, and energy sectors.
3. **Reduced Dependence on Imported Fossil Fuels:**
 - Reduction in dependence on imported fossil fuels and feedstock.
4. **Indigenous Manufacturing:**
 - Development of indigenous manufacturing capabilities.
5. **Employment Opportunities:**
 - Creation of employment opportunities.
6. **Technological Development:**
 - Development of cutting-edge technologies.

The National Green Hydrogen Mission represents India's commitment to **sustainable energy, innovation, and economic growth** while addressing the challenges of climate change and energy security. It aims to **leverage green hydrogen as a key driver for a cleaner, greener, and more self-reliant energy future.**

Blue Hydrogen

- **Production Method:**
 - Natural gas is split into hydrogen and carbon dioxide (CO₂) through processes like Steam Methane Reforming (SMR) or Auto Thermal Reforming (ATR).
 - The CO₂ produced is captured and stored, preventing its release into the atmosphere.
- **Environmental Impact:**
 - Mitigates the environmental impact by capturing and storing CO₂.
- **Carbon Capture Method:**
 - Carbon Capture Usage and Storage (CCUS) technology is used to capture and store the CO₂.

Green Hydrogen

- **Production Method:**
 - Hydrogen is produced by splitting water (H₂O) through electrolysis.
 - This process only yields hydrogen and oxygen.
- **Power Source:**
 - The electrolysis process is powered by renewable energy sources such as wind or solar power.
- **Environmental Impact:**
 - Cleanest option as it produces hydrogen from renewable energy sources without any CO₂ by-product.

Grey Hydrogen

- **Production Method:**
 - Similar to blue hydrogen, natural gas is used in SMR or ATR to produce hydrogen.
 - However, unlike blue hydrogen, the CO₂ produced is not captured and is released into the atmosphere.
- **Environmental Impact:**
 - Leads to emissions of CO₂, contributing to greenhouse gas levels.

Pink Hydrogen

- **Production Method:**
 - Produced through electrolysis, similar to green hydrogen.
 - The difference is that pink hydrogen is powered by nuclear energy.
- **Power Source:**
 - Nuclear energy is used to supply the electricity needed for electrolysis.
- **Environmental Impact:**
 - Produces hydrogen without direct CO₂ emissions from the electrolysis process.

Yellow Hydrogen

- **Production Method:**
 - Also produced through electrolysis like green and pink hydrogen.
 - In this case, the electrolysis process is powered solely by solar energy.
- **Power Source:**
 - Exclusively uses solar power for the electricity needed for electrolysis.
- **Environmental Impact:**
 - Similar to green hydrogen, it **produces hydrogen without direct CO₂ emissions from the electrolysis process.**

[Overcoming theoretical limits on solar cell capacity](#)

Subject: Science and tech

Section: Msc

Photovoltaics and solar cells:

- **Photovoltaics** is a study focusing on the **conversion of light energy into electrical energy**.
- **Solar cells**, which are key devices in **photovoltaics**, harness the energy from the Sun, Earth's primary light and energy source.
- **Solar cells** are comprised of **semiconducting materials**, such as **doped silicon**, that facilitate this energy conversion.

How Solar Cells Work:

- **Sunlight** interacting with **semiconductor** **sex cites electrons** from a lower-energy valence band to a higher-energy conduction band, leaving behind a "**hole**" in the valence band.
- A hole represents a vacant site with a positive charge due to the absence of an electron.
- The **transition of electrons** and the **creation of holes generate electron-hole pairs**, essential for creating photocurrent in semiconductors.

The Shockley-Queisser Limit:

- It is a theoretical concept that defines the **maximum efficiency potential of a solar cell to produce electricity**.
- Named after **Physicists William Shockley (U.S.) and Hans-Joachim Queisser (Germany)**.
- Factors such as **transparency loss (~25%) and thermalisation (~30%) limit the maximum efficiency of solar cells**.
- **Modern solar cells convert only about a third of the incident solar energy into electrical energy**.

Challenges and Innovations:

- **Semiconductors** struggle to utilize **photons** with either **insufficient energy** to overcome the **band gap** or those with **excess energy that merely heats the device**.
- Efforts to surpass the **Shockley-Queisser limit** include **carrier multiplication** (allowing a photon to create multiple electron-hole pairs) and **hot carrier extraction** (capturing high-energy photons before they convert to heat).
- **South Korean physicist Young Hee Lee** highlights these methods as promising pathways to **enhance solar cell efficiency**.

Panel recommends ban on 'ferocious dogs'

Section: Msc

Context:

- An expert committee constituted by the **Department of Animal Welfare and Husbandry, Ministry of Agriculture**, has recommended that certain breeds of "ferocious dogs" be prohibited from being kept as pets.

More in news:

- An official letter has gone out from the department to all States listing out these dog breeds as well as instructions to no longer register licenses that permit their sale.
- The expert committee was constituted after citizen groups complained of attacks on people, sometimes fatal by these dogs.
- The High Court, in December 2023 had said it would decide on the issue "in three months."

Ferocious Dog breeds:

- The breeds include mixed and cross breeds like **Pitbull Terrier, Tosa Inu, American Staffordshire Terrier, Fila Brasileiro, Dogo Argentino, American Bulldog, Boerboel, Kangal, Central Asian Shepherd Dog, Caucasian Shepherd Dog, South Mastiffs, Rottweiler, Terrier, Rhodesian Ridgeback, Wolf Dogs, Canario, Akbash dog, Moscow guard dog, Cane corso and dogs commonly classified as Bandog**.

Lead-acid batteries most successful example of circular economy

Section: Msc

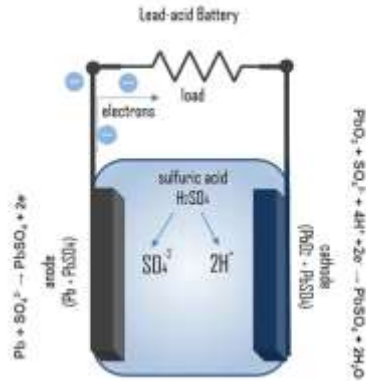
Context:

Amara Raja Energy & Mobility Limited is among the largest lead-acid battery manufacturers in India, clocking in a revenue of over Rs 10,000 crore in FY23.

What is a lead acid battery?

- A **lead acid battery is a rechargeable battery** that uses lead and sulphuric acid to function.
- The lead is submerged into **the sulphuric acid to allow a controlled chemical reaction**.
- This chemical reaction is what causes the **battery to produce electricity**.
- Then, this reaction is **reversed to recharge the battery**.
- The main benefit of the **lithium-ion technology is its far superior energy density**.

- The lead-acid battery and its ecosystem is the most successful example of a **circular economy**– 99 per cent of a lead-acid battery is recyclable and can be brought back in as raw materials.



Lead-Acid vs Lithium-Ion Batteries

Features	Lead-Acid	Lithium-Ion Batteries
The Materials Used	<ul style="list-style-type: none"> In a lead-acid battery, lead is used as the anode, and lead oxide is used as a cathode. Lead-acid batteries use sulphuric acid as an electrolyte 	<ul style="list-style-type: none"> In a lithium-ion battery, carbon is used as the anode, and lithium oxide is used as the cathode. Li-ion batteries use lithium salt as an electrolyte.
Cost	<ul style="list-style-type: none"> Lead-acid batteries are cheaper and are easier to install when compared to Lithium-ion batteries. 	<ul style="list-style-type: none"> The price of a lithium-ion battery is two times higher than a lead-acid battery with the same capacity.
Cycle life	<ul style="list-style-type: none"> A lead-acid battery lasts for 300 to 500 cycles. The complete discharge of the battery significantly affects its life cycle. 	<ul style="list-style-type: none"> Usually, lithium-ion batteries possess a cycle life of 5000, and complete discharge does not affect the life cycle.

Cost

- Lead-acid batteries are **cheaper and are easier to install when compared to Lithium-ion batteries**.
- The price of a **lithium-ion battery is two times higher than a lead-acid battery** with the same capacity.

Cycle life

- A lead-acid battery lasts for 300 to 500 cycles.**
- The complete discharge of the **battery significantly affects its life cycle.**
- Usually, **lithium-ion batteries possess a cycle life of 5000**, and complete discharge does not affect the life cycle.

Battery Capacity

- Battery capacity is the amount of energy stored in a battery per unit volume.
- It is a **direct indicator of the active material stored inside the battery.**
- Lithium batteries have higher battery capacity when compared to lead-acid batteries.**

Energy Density or Specific Energy

- Energy density** is a significant factor in determining the type of battery needed for a specific application.
- It indicates the relation between battery capacity and the weight of the battery.
- Energy Density = (Nominal Battery Voltage (V) x Rated Battery Capacity (Ah)) ÷ Weight of Battery.**
- Lithium batteries have high specific energy when compared to lead-acid batteries.
- Hence, Li-ion batteries are used in EV applications.**

Charging time:

- If a lead-acid battery takes **eight hours to charge**, a **lithium-ion battery would probably take less than two hours to charge**, provided they both have the same capacity.

Weight and Size

- The energy density and battery capacity value of lithium batteries are high when compared to lead-acid batteries.
- Therefore, the weight and size of lithium batteries are much lower in comparison to lead-acid batteries with the same capacity.

Depth of Discharge (DOD)

- The depth of discharge is 50% for lead-acid batteries, and 80% for lithium batteries, respectively.
- This means you can use the lithium-ion battery for a longer period without recharging.
- The modern li-ion battery that is manufactured today is even more efficient, with a DOD of 100%.

The big promise of small-scale LNG as fuel for India, with first SSLNG plant commissioned

Section: Msc

Context:

- Union Minister for Petroleum and Natural Gas Hardeep Singh Puri dedicated to the nation India's first small-scale liquefied natural gas (SSLNG) unit at GAIL (India) Ltd's Vijaipur complex in Madhya Pradesh.

Why small-scale LNG?

- The Indian government is promoting the use of natural gas, aiming to increase its share in the primary energy mix to 15% by 2030, up from just over 6% currently.
- However, **expanding gas consumption** faces **challenges**, particularly in **transporting gas to areas not connected by the natural gas pipeline grid**, affecting its use in **long-haul transportation**.
- To address these challenges and the slow progress of large-scale pipeline projects, **small-scale LNG (SSLNG)** emerges as a viable solution. **SSLNG facilities**, like the one at **Vijaipur**, are expected to **significantly alter the natural gas landscape in India**. Additionally, **GAIL** is investing **Rs 650 crore** in **developing dispensing stations** along major highways, including the **Golden Quadrilateral**, to facilitate the use of **LNG** as an **automotive fuel**.

What exactly is SSLNG?

- **SSLNG**, a term with **no standard global definition** in its **nascent stage**, refers to the **process of liquefying natural gas for transportation in smaller-scale operations**, distinct from the **large-scale infrastructure** typically associated with **LNG**.
- This involves **supplying LNG—natural gas in its liquid or super-chilled form—via specialized trucks and small vessels to industrial and commercial consumers in areas not served by pipelines**.
- In cases where the **LNG** is to be used as **compressed natural gas (CNG)** for vehicles or piped gas for households and manufacturing, it is **regasified** using **small vaporizers**. For direct use in its liquid form, **LNG** is supplied to **end-users without regasification**.
- The **SSLNG** supply chain can **originate** from **large-scale LNG import terminals**, where **LNG** is transported to consumers in **cryogenic road tankers** or **small vessels** instead of through pipeline regasification.
- Alternatively, it can start in **areas with abundant natural gas supplies or production**, where **small liquefaction plants** are established. An example of this latter approach is the **SSLNG unit at Vijaipur**, part of **GAIL's largest gas processing facility**.

How the SSLNG Unit at GAIL's Vijaipur Complex Works:

- The **SSLNG unit**, a **Rs 150 crore** facility at **GAIL's Vijaipur complex**, features **SSLNG skids** with a **total capacity of 36 tonnes per day** and associated liquid handling systems.
- It utilizes **zeolite pretreatment skids (ZPTS)** for **removing impurities** like **nitrogen, water, sulfur, and carbon dioxide** from **natural gas** at about **15 bar pressure**.
- The gas is then **compressed** to around **260 bar** in a **four-stage compressor** and cooled to **-60 to -70 degrees Celsius** using a **propane-based refrigeration system**.
- Following expansion, the **temperature drops below -140 degrees Celsius**, liquefying the gas. The resulting **LNG** is dispatched via **cryogenic tankers** for use in **city gas distribution networks** as **CNG** and **piped gas**, and at **LNG filling stations** for vehicles.
- The unit employs an **automated, web-based Supervisory Control and Data Acquisition (SCADA) system** for monitoring.

The Business Case for SSLNG:

- **GAIL** leads the initiative, but most major oil and gas companies in India are exploring this high-growth sector.
- The movement towards **SSLNG** in **India** initially gained momentum through **Petronet LNG Ltd**, the **country's largest LNG importer**, which began supplying **LNG** from its **large import terminals** in **Gujarat** and **Kerala** to **small industrial consumers**.

- **Petronet**, backed by **GAIL, ONGC, IOC, and BPCL**, promotes the **use of LNG** as **automotive and marine fuel**, and for **city gas distribution networks** and industries requiring natural gas.
- The strategy **aims to increase LNG consumption nationwide** and **boost volumes** at the **Kochi terminal**, which has faced challenges due to lack of pipeline connectivity to key consumers.

Using LNG (Liquefied Natural Gas) as a fuel for long-haul trucks and buses is becoming increasingly attractive due to several reasons:

- **Environmental Benefits:** LNG produces **significantly lower carbon dioxide emissions** than diesel and **emits negligible amounts of particulate matter, nitrogen oxide, and sulfur dioxide**, making it a cleaner alternative.
- **Economic Efficiency:** Vehicles powered by LNG can **travel a slightly longer range on similar-sized fuel tanks compared to diesel** and benefit from generally **lower prices than crude oil**, from which diesel is derived. Since **India imports only about half of its natural gas needs** (as opposed to a much larger proportion of its crude oil), switching to LNG could result in significant foreign exchange savings.
- **International Examples:** Countries like **China** have already adopted **LNG aggressively** in their **medium and heavy commercial vehicle sectors**, demonstrating its viability.

Challenges in India's Adoption:

- **Lack of availability and higher initial costs of LNG-powered vehicles** compared to diesel variants, **absence of LNG vehicle financing options**, and a nearly **non-existent LNG retail infrastructure**.
- **Efforts to Overcome Challenges:** Entities like **GAIL and Petronet** are actively working to establish a **supportive ecosystem** for the transition from diesel to LNG.
 - This includes collaborations with commercial vehicle manufacturers for trials, discussions with state roadways and truck fleet operators, and the establishment of LNG dispensing stations along highways.
 - **Indian Oil Corporation (IOC)** is also involved in setting up LNG stations, aiming to enhance the LNG infrastructure for vehicles.

Target of 25-cr. Smart meters by 2025 to be missed by long mile

Section: Msc

Context: The government's aim to install 25 crore smart meters by 2025 is unlikely to be met on account of slow progress in implementation, with expectations of only up to half the numbers will be installed.

What are Smart Meters?

- Smart meters are next-generation digital electricity meters that measure energy consumption and communicate this information back to the utility company in near real-time.
- Unlike traditional electric meters that require manual reading, smart meters automatically send readings to the utility company, enabling a two-way communication between the meter and the utility.

- The **Smart Meter National Programme (SMNP)** is an initiative by the government of India aimed at promoting the adoption and installation of smart meters across the country to improve the billing and collection efficiencies of distribution companies (DISCOMs).
- The programme aims to replace 25 crore conventional meters with smart meters in India, thereby facilitating the transition to a modern, efficient, and digitally enabled power distribution system.

- The implementation of the SMNP is entrusted to Energy Efficiency Services Limited (EESL), a joint venture of four National Public Sector Enterprises: NTPC Limited, PFC, REC, and POWERGRID, established under the Ministry of Power.

The status of India's nuclear programme

Section: Nuclear Technology

Context:

- On March 4, Prime Minister Narendra Modi witnessed the start of the process of **core-loading** the **indigenous Prototype Fast Breeder Reactor (PFBR)** at the **Madras Atomic Power Station in Kalpakkam, Tamil Nadu**.

What is PFBR?

- The **Prototype Fast Breeder Reactor (PFBR)** is a significant advancement in **nuclear technology**, designed to **produce more nuclear fuel than it consumes**.
- This reactor marks a **pivotal point in India's nuclear power strategy**, representing the commencement of the **second stage of India's three-stage nuclear power programme**.
- Initially, **India utilized Pressurised Heavy Water Reactors (PHWRs)** and **natural uranium-238 (U-238)** as the **primary fissile material** in the **first stage**, producing **plutonium-239 (Pu-239)** and **energy through nuclear fission processes** involving **U-235** and **heavy water as a neutron moderator**.
- In the **second stage**, the **PFBR** will use **Pu-239** along with **U-238** to **generate energy, U-233**, and additional **Pu-239**. This step is facilitated by **Bharatiya Nabhikiya Vidyut Nigam Ltd. (BHAVINI)**, established by the **Department of Atomic Energy (DAE)** in **2003**.
- The **final stage** involves **combining Pu-239 with thorium-232 (Th-232)** to produce **energy and U-233**. This strategic progression, conceptualized by **Homi J. Bhabha**, leverages **India's substantial thorium reserves**, aiming to **achieve self-sufficiency in nuclear energy** for the country.

Why was the PFBR delayed?

- The development of the **Prototype Fast Breeder Reactor (PFBR)** in **India** has been fraught with setbacks, including **prolonged delays, escalating costs, and several broken commitments**, attracting a wide array of critics.
- There were **international sanctions imposed on India** after the **'Smiling Buddha' nuclear test**, necessitating a switch from the **planned enriched uranium** to a **mixed carbide fuel**.
- Additionally, **technical issues with the reactor coolant** further contributed to the project's delay, pushing the **commercial operation deadline to October 2022**.

How does PFBR work?

- The **Prototype Fast Breeder Reactor (PFBR)** operates on the **principle of using a breeder reactor mechanism**, where it **generates more fissile material (plutonium-239, Pu-239) than it consumes**.
- In contrast to **Pressurised Heavy Water Reactors (PHWRs)** that utilize **natural or low-enriched uranium-238 (U-238)** and **produce Pu-239 as a byproduct**, the **PFBR** takes this produced **Pu-239** and **combines it with additional U-238** in a **mixed oxide form**. This **mixture** is then **loaded** into the **reactor's core** along with a **breeder blanket**, a layer that interacts with the fission products to create more **Pu-239**.
- A **distinctive feature** of the **PFBR** is its use of **fast neutrons** (hence "fast" in the name), which are **not moderated or slowed down**, enabling certain **fission reactions** that contribute to the **breeding process**.
- The reactor uses **liquid sodium** as a **coolant** in **two separate circuits for safety and efficiency**. The **primary circuit** carries the **coolant** through the **reactor core**, absorbing **heat and radioactivity**, and then **passes the heat** (but not the radioactivity) to a **secondary coolant circuit** through **heat exchangers**.
- This **secondary circuit** then uses the **transferred heat** to **generate electricity**.
- **Challenges in operationalizing the PFBR** have been noted, including the **complex behavior of its systems in practical settings** compared to **theoretical expectations**. For instance, the **process of preheating the reactor vessel to 150 degrees Celsius** took significantly longer than anticipated.

What role can SMRs play?

- **Small Modular Reactors (SMRs)** are emerging as a promising **alternative to traditional large-scale nuclear reactors**, especially in the wake of delays experienced with projects like the **Prototype Fast Breeder Reactor (PFBR)**.
- With a **maximum capacity of 300 MW**, **SMRs** require **less land** and **incorporate enhanced safety features**.
- **SMRs** also have the **potential to utilize low-enriched uranium**, which **India** could **import from the U.S.** under the **123 Agreement**.

- Expanding the role of **SMRs** in **India's energy mix** would necessitate amendments to the **Atomic Energy Act (1962)** and related legislation to enable **private sector involvement** under the **supervision** of the **Atomic Energy Regulatory Body (AERB)**, ensuring that both **nuclear fuel** and **waste management** adhere to **international safeguards** as directed by the **Department of Atomic Energy (DAE)**.

Significance and challenges of Phase II:

- **Stage II** of **India's nuclear power program**, represented by the **Prototype Fast Breeder Reactor (PFBR)** and its envisioned expansion with **four more Fast Breeder Reactors (FBRs)**, each with a **600 MWe capacity**, is aimed at **enhancing the country's nuclear power output**.
- **Challenges:**
 - **Renewables**, such as **solar energy**, have become **significantly cheaper**, making **nuclear power less competitive in terms of cost**.
 - Public sentiment towards nuclear energy has shifted after the **Fukushima Daiichi disaster in 2011**.
 - The **technical and operational complexities** associated with **FBRs**.
 - The **use of thorium** in future reactors introduces **complications** due to the **production of various radioactive isotopes**, complicating **waste handling and storage**.
- **Recommendations:**
 - The **International Atomic Energy Agency** has recommended establishing an **independent statutory regulator**, leading to the proposal of the **Nuclear Safety Regulatory Authority (NSRA) Bill**.

How is nuclear waste generated?

Section: Nuclear science/energy

Context:

- Recently, **India** loaded the **core** of its **Prototype Fast Breeder Reactor (PFBR)** vessel, bringing the country to the cusp of **stage II** — powered by **uranium** and **plutonium** — of its **three-stage nuclear programme**.

What is nuclear waste?

- **Nuclear waste** refers to the **radioactive byproducts** resulting from the **fission process in nuclear reactors**, where **neutrons bombard nuclei of specific elements** like **uranium-235**, causing them to **split** and **release energy** along with **new elements** that **cannot undergo further fission**.
- These **non-fissionable elements**, such as **barium-144** and **krypton-89**, along with **spent fuel** that contains **radioactive fission products** and elements produced through neutron absorption and radioactive decay, constitute **nuclear waste**.
- This waste is **highly radioactive** and **necessitates containment** in specially designed-facilities to **prevent leakage and environmental contamination**.

How do we handle nuclear waste?

- Handling nuclear waste primarily involves **managing spent fuel**, which is both hot and radioactive. Initially, this **spent fuel** is **stored underwater for cooling**, potentially for decades.
- Post-cooling, it is **transferred to dry casks for long-term storage**. Countries with significant **nuclear power programs**, such as **the U.S., Canada, and Russia**, have **accumulated large quantities of spent fuel**, necessitating **storage solutions** that ensure **isolation from human contact** for periods extending far beyond the history of modern humans.
- Additionally, **nuclear power plants process liquid waste**, which can involve **discharging treated water with short-lived radionuclides** into the environment, as seen with Japan's treatment and discharge from the **Fukushima plant** into the **Pacific Ocean**. Depending on the hazard level, other **liquid wastes** are managed through **evaporation, chemical precipitation, absorption on solid matrices, or incineration**.
- For **high-level liquid waste** containing most **fission products from the fuel**, **vitrification** is employed to **transform it into a stable glass form** for storage.
- In India, due to the **reprocessing of spent fuel to extract uranium and plutonium for use as fuel**, the remaining **fission products** present in the **liquid waste** pose additional accident hazards and require secure storage.

How is nuclear waste dealt with?

- **Nuclear waste is managed through several methods:**
- **Dry-Cask Storage:** After cooling in a **spent fuel pool** for a **minimum of a year**, spent fuel is moved to **dry-cask storage**. It's placed inside large steel cylinders, surrounded by inert gas, sealed, and then housed in steel or concrete chambers for safety.

- **Geological Disposal:** As proposed by some experts, this method involves sealing the waste in special containers and burying it underground in stable geological formations like granite or clay. This method aims for long-term isolation from human activities, though there's a concern about potential exposure from disturbances such as digging.
- **Reprocessing:** This technology **separates fissile material** (usable in further nuclear reactions) **from non-fissile material in spent fuel through chemical processes. Reprocessing aims to increase fuel efficiency and reduce waste**, but it requires extensive protection due to the hazardous nature of the materials handled. A significant issue with reprocessing is that it produces weapons-usable plutonium, necessitating strict international regulations.

How does India handle nuclear waste?

- In **India**, nuclear waste is managed through **facilities in Trombay, Tarapur, and Kalpakkam**, with each serving specific functions ranging from producing plutonium for reactors and weapons to processing spent fuel from various reactor types.
- According to a **2015 report**, the **management of low and intermediate-level waste** is conducted **onsite at nuclear power stations**, with **comprehensive monitoring for radioactivity** around these areas.
- Challenges have been noted regarding the **efficiency and capacity factors of reprocessing facilities**, as well as potential complications from the **varied waste** produced by different reactor types, such as the **PFBR (Prototype Fast Breeder Reactor)**.

Issues associated with nuclear waste encompass environmental, operational, and financial challenges:

- **Environmental Concerns:** Historical instances, like the **Asse II salt mine in Germany**, illustrate the **risk of nuclear waste contaminating water resources**, including groundwater. This case underscores the **environmental hazards** and the extensive efforts and costs required for decontamination, estimated between **€5 billion and €10 billion** over about **30 years**.
- **Operational Risks:** The **Waste Isolation Pilot Plant (WIPP)** in the **U.S.** demonstrated the potential for "**unknown unknowns**" when an **accident in 2014 released radioactive materials into the environment**, despite the facility being operational since **1999** with a license for millennia-long storage. This incident revealed significant maintenance failures.
- **Uncertainties in Waste Treatment:** Questions remain regarding the **effectiveness of vitrification plants at reprocessing facilities** and the **amount of high-level and intermediate-level liquid waste yet to be vitrified**, indicating uncertainties in managing liquid waste.
- **Siting and Ethical Issues:** Efforts to locate **repositories for nuclear waste** have frequently failed across different countries, raising concerns about environmental injustice and the ethical dilemma of exporting nuclear waste. The principle that those benefiting from nuclear power should also bear its disposal costs is a significant ethical consideration.
- **Financial Implications:** **Managing nuclear waste imposes considerable costs** on the nuclear power sector. An analysis of a hypothetical **1,000 MWe nuclear power plant** operating at a **70% capacity factor for 30 years** revealed that **waste management costs account for a significant portion of total expenses**. The **front-end cycle, operation waste management, and decommissioning**, along with the **back-end fuel cycle**, contribute to the overall costs, imposing an estimated **\$1.6-7.1 per MWh** of nuclear energy generated.

FBR and energy security

Section: Nuclear energy/science

India's FBR programme

- **India's Fast Breeder Reactor (FBR) program**, initiated **two decades ago**, aims to develop **comprehensive nuclear fuel cycle capabilities**, including **electricity production from uranium** in nuclear power reactors.
- In **2003**, under Prime Minister Atal Bihari Vajpayee, **Bharatiya Nabhikiya Vidyut Nigam Ltd (BHAVINI)** was established to construct and operate the **Prototype Fast Breeder Reactor (PFBR)**, marking **India's most advanced nuclear reactor project**.
- Initially projected to complete by September 2010, technological challenges led to delays, with the latest completion target set for October 2022. Upon completion, **India will become the second country, following Russia, to have a commercial operating FBR**, positioning it **ahead of China's smaller fast breeder program**. Programmes in countries such as **Japan, France, and the United States** were shut down amid safety concerns.

From 'fertile' to 'fissile'

- **India's Department of Atomic Energy (DAE)** has devised a **three-stage power program aimed** at harnessing the country's abundant **thorium reserves** to generate electricity.
- These **thorium reserves** are located in **coastal and inland placer sands across various states**, including **Kerala, Tamil Nadu, Odisha, Andhra Pradesh, Maharashtra, Gujarat, Jharkhand, and West Bengal**. **Placer deposits, naturally concentrated by gravity, contain valuable minerals such as thorium (from monazite ore), gold, platinum, titanium, uranium, and rare earth elements.**


- The vision for this nuclear power program, ensuring **energy security**, was developed by **Dr. Homi J Bhabha** and **Dr. Vikram Sarabhai**.
- They recognized the significance of **Fast Breeder Reactors (FBRs)** which generate more nuclear fuel than they consume by **converting fertile isotopes into fissile material**.
- The program is structured in **three stages**, focusing on **converting 'fertile' material into fissile material**.
- For instance, **uranium-238** is converted into **plutonium-239** within nuclear reactors, and **thorium-bearing monazite** is transformed into **fissile uranium-233**.
- **India** follows a "**closed fuel cycle**" strategy, **reprocessing spent fuel to separate useful isotopes (Pu239 and U233) for further use**, which is crucial for multiplying the fissile inventory and eventually leveraging thorium in the program's third stage.
- The **FBR** plays a vital role in this transition, setting the foundation for the full utilization of thorium resources.

NUCLEAR FUELS & REACTORS

NUCLEAR FUELS are classified as 'fissile' (U233, U235, Pu239) or 'fertile' (U238, Th232). Fissile isotopes can be directly used as nuclear fuel; fertile isotopes need to be converted into fissile before they can be used. U235 is the only fissile isotope that occurs in nature.

IN INDIA, resources of exploitable uranium (natural uranium is mostly U238, with only 0.7% U235) are limited, while thorium (Th232) is abundantly available.

BOTH fissile and fertile isotopes are precious commodities that must be used judiciously for optimum utilisation. Pressurised Heavy Water Reactors, which burn U235, also convert fertile U238 to Pu239. This plutonium is used in Fast Breeder



Prime Minister Narendra Modi in Kalpakkam on March 4. PTI

Reactors as fuel to generate electricity.

FAST REACTORS produce more fuel than they consume. They also aid in the conversion of fertile Th232 into fissile U233, which can be used to fuel subsequent reactors.

INDIA'S THREE-STAGE PROGRAMME

STAGE 1: PHWRs use natural uranium-based fuels to generate electricity, while producing fissile Pu239, which can be extracted by reprocessing the spent fuel.

STAGE 2: FBRs of the kind at Kalpakkam, using Pu-based fuels, can enhance nuclear power capacity, and convert fertile thorium into fissile uranium (U233). Reprocessing of the

utilisation of plutonium inventory.

STAGE 3: U233 produced in the second stage can be used for the third stage of the power programme, which consists of advanced thermal and fast breeder reactors, for long-term energy security. In addition, fissile isotopes can be produced by Accelerator-driven Subcritical Reactor (ADS) systems.

Three stages and FBR

1. **The first stage** - the setting up of **Pressurised Heavy Water Reactors (PHWRs)** and associated **fuel cycle facilities** — is in progress.
 - **PHWRs** are reactors that use natural uranium as fuel and heavy water (deuterium oxide) as coolant and moderator.
 - **Nuclear Power Corporation of India Ltd** operates **22 commercial reactors** with an installed capacity of 6,780 MWe.
 - The programme has been supplemented by construction of imported **Light Water Reactors (LWRs)** - the first of two units built with Russian collaboration is already generating power.
2. **The second stage** involves the setting up of **FBRs** backed by **reprocessing plants** and **plutonium fabrication plants**, primarily to multiply the inventory of fissile material.
3. **The third stage** will be based on the **Th-U233 cycle**.
 - For producing **U233**, obtained by **irradiation of thorium** in **PHWRs** and **FBRs**, an **Advanced Heavy Water Reactor (AHWR)** is proposed.

- The combination of power reactors from **all the three stages** is expected to ensure **long-term energy security for the country**.
- But the **commercial utilisation of thorium** on a significant scale can begin **only when abundant supplies of either U233 or Pu239 are available**.

Way forward hereafter

- The **Fast Breeder Reactor (FBR)** will start its operations using a **Uranium-Plutonium Mixed Oxide (MOX) fuel**, surrounded by a **U238 'blanket'** that will **produce additional fuel through nuclear transmutation**.
- The **India-US civil nuclear deal** has further facilitated the process, allowing India to **import uranium for domestic reactors** and thereby accelerating the nuclear program.

Nuclear energy: fixing the finance

Section: Nuclear energy

Context:

- On March 21, **Brussels** hosted the **first-ever Nuclear Energy Summit**, co-chaired by the **Prime Minister of Belgium Alexander De Croo** and the **Director General of the International Atomic Energy Agency (IAEA) Rafael Mariano Grossi**.

Details:

- The **UN Climate Change Conference (COP28)** in **Dubai** in December 2023 highlighted **nuclear energy's essential role in achieving climate goals**.
- A **declaration by 22 world leaders** called for **tripling nuclear energy capacity by 2050**, aligning with the **IAEA's 'Atoms4Netzero' initiative**.
- **Nuclear power** is favoured for its **low carbon emissions—four times less than solar farms** and other renewables like **wind, hydropower, and geothermal—and its ability to provide constant energy without geographical limitations**.
- Additionally, **nuclear power plants** boast **low operating costs, require less land, and have a longer lifespan** than other renewable sources.

How can nuclear energy be financed?

- **Financing nuclear energy**, crucial for its **large-scale adoption** as a **primary energy source**, hinges on advancements in **nuclear technology and financial strategies**.
- **Innovations** such as **Small Modular Reactors (SMRs)** and improved safety measures are pivotal in reducing nuclear risks and stigma, potentially attracting tech startups into this traditionally government-dominated sector.
- Despite technological progress promising significant **carbon emission reductions**, with an **IAEA study** indicating **half of the reductions by 2050 may come from emerging technologies**, financial support from **Multilateral Development Banks (MDBs)** and private investors **remains scarce**.
- The **World Bank's last nuclear project loan** was in **1959**, underlining the urgent need for policy reassessment to enable private or blended finance models in nuclear energy funding.

Has the cooperative model worked?

- The **cooperative model** has proven **successful in funding nuclear energy projects**, with notable examples in **France, South Korea, Russia, and the U.K.**
- This approach involves a **consortium of investors raising market credit and assuming full project responsibility**.
- **Finland's 'Mankala' model** showcases a **cooperative finance structure** where **companies share the construction and operational costs of energy producers**, benefiting from **cost-based energy access without dividends**.
- Such financial innovation, coupled with market support and low-interest rates, can significantly advance nuclear energy.
- Globally, **440 nuclear reactors** contribute a **quarter of the world's low-carbon energy**, with an **increase** indicated by **60 reactors** under construction and **110 planned**, particularly in **Asia** and notably in **China**.
- **China aims** to escalate its **nuclear energy production to 10% by 2035 and 18% by 2060**.
- Despite the expansion, challenges in **nuclear infrastructure development and financing persist**, as highlighted by the **termination of NuScale Power's SMR project in Utah** and the financial difficulties faced by industry giants **Westinghouse and Areva**.

What about India?

- **India's nuclear power**, despite offering **cost-effective energy solutions** compared to **solar power**, constitutes **only 1.6% of its renewable energy mix** due to concerns such as **stigma, safety risks, regulatory challenges, high initial costs, and project delays**.

- However, recent liberalization in the nuclear sector, including inviting **\$26 billion** in private investments and plans to significantly **increase nuclear capacity to 22,480 MW** by **2031-2032**, signals a positive shift.
- Prime Minister Modi's engagement with the **Prototype Fast Breeder Reactor (PFBR)**, which can **simultaneously produce fuel and power**, highlights progress towards a more self-reliant and ambitious nuclear industry in India.

Atoms4NetZero

- **It is** an IAEA initiative that supports efforts by Member States to harness the power of nuclear energy in the transition to net zero. The initiative provides Member States and stakeholders including industry, financial institutions, and international organizations with technical expertise and scientific evidence on the potential of nuclear energy to decarbonize electricity production as well as hard-to-abate sectors such as industry and transport.
- As countries grapple with the climate crisis and growing energy security concerns, nuclear energy is increasingly recognized for the role it can play in an accelerated transition to net zero. Nuclear power currently provides about 10% of the world's electricity, equivalent to about a quarter of all low-carbon electricity. Atoms4NetZero seeks to inform policymakers and decision-makers on the potential way forward for nuclear power as the reliable backbone of clean, affordable, resilient and more secure energy transitions.

What will Gaganyaan change for India?

Section: Space technology

Context:

- Prime Minister Narendra Modi publicised the final shortlist of candidates to be astronauts on board the **maiden human spaceflight mission- Gaganyaan-** of the **Indian Space Research Organisation (ISRO)**.

About Gaganyaan:

- **Gaganyaan** is an **ISRO mission aiming to send Indian astronauts to low-Earth orbit** using an **Indian launch vehicle**.
- It is a **demonstration mission** to test technologies essential for **human spaceflight**, showcasing **India's capability in producing, qualifying, and utilizing** these technologies.
- **Future goals for ISRO** include **establishing an indigenous space station by 2035** and **landing an Indian on the moon by 2040**.
- **ISRO** plans to integrate these ambitious projects with **future lunar explorations**, starting with a joint mission with **Japan** for **lunar rover landing** and a **mission to return lunar soil samples to Earth**.
- The Indian government has expanded spaceflight and services responsibilities beyond ISRO to **New Space India Ltd. (NSIL)** for **commercialization** and the **Indian National Space Promotion and Authorization Centre (IN-SPACe)** for **authorizing space activities**.
- Additionally, ISRO has established the **Human Space Flight Centre (HSFC)** to coordinate the **Gaganyaan mission**.

Components of Gaganyaan:

- **Gaganyaan's components** include the **Launch Vehicle Mark-3 (LVM-3)**, the **orbital module**, and the **crew**.
 - The **LVM-3**, previously known as the **GSLV Mk-III**, is a **three-stage rocket** with **solid-fuel boosters, liquid-fuelled Vikas 2 engines**, and an **indigenous cryogenic engine** using **liquid hydrogen and oxygen**.
 - The **orbital module**, weighing **8.2 tonnes**, comprises the **crew and service modules**. It can support **up to three astronauts for a week** and is **equipped with parachutes, an environmental control and life-support system (ECLSS)**, and a **crew escape system**.
 - The **service module** contains the **propulsion system** for **orbital maneuvers and re-entry**.
 - The **crew**, consisting of **Indian Air Force personnel Prashant Nair, Ajit Krishnan, Angad Pratap, and Shubanshu Shukla**, underwent training in **India** and advanced training in **Russia**.
- The mission will also include a **gynoid** named '**Vyommitra**' equipped with sensors to monitor various conditions and emergencies within the capsule.

How was the mission put together?

- The Gaganyaan mission by ISRO was assembled following the Union Cabinet's approval in **2018**, building on technologies already realized by that time.
- Post-approval, ISRO human-rated these technologies to meet human spaceflight standards.
- **Key preparatory experiments** included the **Space Capsule Recovery Experiment (SRE)** in **2007** and the **Crew-module Atmospheric Re-entry Experiment (CARE)** in **2014**, both crucial for testing **module separation, heat shield efficacy, braking systems, and retrieval procedures**.

- Additionally, in October 2023, it was revealed that despite initial plans, the **crew module** would need to be procured internationally due to a lack of domestic manufacturing capability, and efforts to source **Environmental Control and Life Support System (ECLSS) technologies** abroad were unsuccessful, leading **ISRO** engineers to develop them internally.
- The mission's components, including **engines and rocket stages**, underwent extensive testing, simulations, and quality control, exemplified by the completion of tests on four CE-20 engines under flight-like conditions.

What will Gaganyaan achieve?

- **Gaganyaan aims** to establish **India's self-sufficiency in human spaceflight**, enabling the country to **send humans to space** on its **own schedule** rather than **depending on costly foreign launch services**.
- This initiative is part of broader space sector reforms in India, including the creation of **NSIL** and **IN-SPACe**, the **National Geospatial Policy 2022**, the **Indian Space Policy 2023**, and the **Telecommunications Act 2023**.
- Furthermore, these reforms have encouraged investment in **India's emerging space startups** by allowing **49% to 100% automatic foreign direct investment in space services and spaceflight**.
- The **Indian Space Policy** outlines **India's objectives** for its **space program** in the coming decades, positioning the country within the **global 'space race'** that includes scientific, commercial, and exploratory missions beyond Earth.
- **Gaganyaan's development** aligns with these broader efforts, marking **India's presence in outer space** and on the **moon** alongside other nations, emphasizing the importance of a human presence from diverse nationalities in space for extended periods.

Meet MethaneSAT, a satellite which will 'name and shame' methane emitters

Section: Space technology

Context:

- **MethaneSAT**, a satellite designed to **monitor and quantify methane emissions globally**, was launched on a **SpaceX Falcon9 rocket** from **California** on March 4. Although **not the first of its kind**, this washing-machine-sized satellite surpasses its predecessors in providing more detailed information and possessing a significantly broader field of view.

Why do we need to track and measure methane emissions?

- **Methane**, a **potent greenhouse gas** and the **second largest contributor to global warming after carbon dioxide** is **responsible for 30% of global heating** since the Industrial Revolution.
- It is **80 times more effective at trapping heat compared to carbon dioxide** over a 20-year period, as per the **United Nations Environment Programme**.
- Additionally, **methane** contributes to the **formation of ground-level ozone**, a harmful gas that can **lead to one million premature deaths annually** according to a **2022 report**.
- The **primary source of human-caused methane emissions**, making up about **40%** of the total, comes from **fossil fuel operations**.
- **MethaneSAT** aims to address this critical issue by targeting and helping to reduce methane emissions globally.

What is MethaneSAT?

- **MethaneSAT** is a **satellite project** initiated by the **Environmental Defense Fund (EDF)**, a **US-based nonprofit environmental advocacy group**, in collaboration with **Harvard University**, the **Smithsonian Astrophysical Observatory**, and the **New Zealand Space Agency**.
- Its **mission** is to orbit the Earth **15 times daily** to specifically monitor **methane emissions** from the **oil and gas sector**.
- The **satellite** will generate **extensive data** detailing the **volume of methane emissions**, their sources, the responsible parties, and the temporal trends of these emissions.
- This initiative **aims** to provide **critical insights** into **methane emission patterns**, facilitating targeted efforts to reduce the **environmental impact of these potent greenhouse gases**.

Features of MethaneSAT:

- **MethaneSAT** is designed to enhance the **detection** and **tracking** of **methane emissions**, addressing the limitations faced by existing satellites in measuring and identifying methane sources accurately.
- It is equipped with a **high-resolution infrared sensor** and a **spectrometer**, enabling it to **detect subtle differences in methane concentrations as low as three parts per billion**.
- This capability allows **MethaneSAT** to identify smaller methane emission sources that have been challenging to **track with previous technologies**. Furthermore, its **wide-camera view** spans approximately **200 km by 200 km**, which aids in the identification of both smaller sources and larger, "**super emitter**" sources of methane emissions.

Significance:

- The **significance of MethaneSAT** lies in its potential to **bridge critical data gaps** highlighted by **discrepancies between actual methane emissions and those reported by national governments**; an **International Energy Agency (IEA) report** suggests that **global methane emissions** are about **70%** higher than national reports indicate.
- The data collected by **MethaneSAT** will be processed using **advanced cloud-computing and AI technology** developed by **Google**, a mission partner.
- This processed data will be publicly available through **Google's Earth Engine platform**, ensuring broad access to the information needed to **tackle methane emissions** more effectively.

Why is ISRO building a second rocket launchport in Tamil Nadu's Kulasekarapattinam?

Section: Space tech

Context:

- Prime Minister Narendra Modi laid the foundation stone of the **second rocket launchport of the Indian Space Research Organisation (ISRO) at Kulasekarapattinam on February 28.**

More on news:

- Situated at a geographically advantageous location in **coastal Tamil Nadu's Thoothukudi district**, the facility costs **Rs 986 crore.**
- It will be extensively and exclusively used for commercial, on-demand, and small satellite launches in the future.

Why does India need a new launchport?

- With the Union government's recent policy announcing the opening of the **space sector to private players**, a **sharp rise in the number of commercial launches is certain.**
- To ensure that **ISRO's first launchport, the Satish Dhawan Space Centre (SDSC) SHAR** in Sriharikota, is not overburdened with a high number of launches, the space agency has decided to build another facility.
- While SHAR will be **only used for launching bigger and heavy-lift-off missions**, the **Kulasekarapattinam launchport will be used to launch smaller payloads.**
- SHAR will also be available for India's **big ticket missions to the Moon, Venus, and much touted human-flight mission, the Gaganyaan.**
- Private players could develop **space-qualified sub-systems, build satellites, and even launch vehicles using the new launchport.**
- It will also facilitate dedicated launch infrastructure for all the on-demand commercial launches.

Why is the new ISRO launchport located in Tamil Nadu?

- Geographically, scientifically, and strategically, the Kulasekarapattinam launchport provides a natural advantage to ISRO's future launches pertaining to the Small Satellite Launch Vehicle (SSLV).
- Allowing a **direct southward and smaller launch trajectory for the light weight SSLVs carrying less fuel**, the **Kulasekarapattinam facility** will boost ISRO's attempts to enhance payload capacities.
- Currently, the **trajectory followed by all launches from SHAR** are longer as they follow a path which requires the vehicle to skirt eastwards around Sri Lanka before taking the actual southward flight.
- This **consumes additional fuel.**
- However, the same would not be required for future launches from Kulasekarapattinam, which is geographically located several kilometers to the west of Colombo, thereby allowing a straight southward flight and simultaneously saving the already limited fuel available onboard SSLV.
- Notably, both the launch ports are located in **Southern India, near the equator.**
- For a launch site close to equator the magnitude of the velocity imparted due to **Earth's rotation is about 450 m/s**, which can lead to substantial increase in the payload for a given launch vehicle.
- **Geostationary satellites must necessarily be in the equatorial plane.**
- So, for such satellites, the closer the launch site is to the equator the better it is.

What are SSLVs and what are they used for?

- SSLV is the **new small satellite launch vehicle developed by ISRO** to cater for the launch of small satellites.
- It has a **three-stage launch vehicle, having a lift-off weight of about 120 tonnes and is 34 meters in length and 2 meters in diameter.**

- SSLV is **designed with a three-stage solid propulsion and a liquid propulsion stage, which is the terminal stage.**
- The SSLV missions are useful to **launch small-sized satellites weighing anywhere between 10 to 500kg into the Low Earth Orbit.**
- Going by their **size and weight, these are typically referred to as mini, micro or nano satellites.**
- **They are low on cost and intended satellite insertion into orbits takes a shorter flight time.**
- SSLV are best suited for **commercial and on-demand launches.**
- Previously, satellite projects built by college students and private players involved in the space sector have benefitted from SSLV missions.

How has India's SSLV journey been so far?

- SSLV is a relatively **new development by ISRO**, which is expanding its launch capabilities.
- The **first SSLV mission SSLV-D1** i.e. carrying two satellites, including EOS-02 and AzaadiSat, in August 2022, was a failure.
- Despite a **text-book launch, perfect lift-off and smooth transitioning into subsequent stages**, the insertion of the two satellites after their separation took place into a 356 km circular orbit instead of the intended elliptical orbit.
- Six months later, in its second attempt with the **SSLV-D2 in February 2023, ISRO tasted success.** The rocket inserted three satellites onboard into the intended 450 km circular orbit following a 15 minute flight.
- Both these launches were from SHAR.

What are the features of SHAR?

- SHAR is situated along the east coast of Andhra Pradesh and is located 80 km off Chennai.
- It currently provides launch infrastructure to all ISRO missions.
- It is equipped with a solid propellant processing setup, static testing, and launch vehicle integration facilities, telemetry services — tracking and command network to oversee the launch — and a mission control center.
- SHAR has two launch complexes that are routinely used to launch the Polar Satellite Launch Vehicle (PSLV), the Geosynchronous Space Launch Vehicles (GSLV) and the Geosynchronous Satellite Launch Vehicle Mk-III, now renamed as LVM3.
- The maiden launch from the First Launch Pad, built in the early 1990s, was in September 1993. Operational since 2005, the Second Launch Pad saw its maiden launch in May 2005.

Centre to rope in ISRO to provide Internet in 80 remote tribal villages

Section: Space sector

Context:

- The **Ministry of Tribal Affairs** plans to partner with the **Indian Space Research Organisation (ISRO)** to introduce **V-SAT stations for Internet services** in approximately **80 tribal villages** across **Jharkhand, Madhya Pradesh, Odisha, and Maharashtra.**

Details:

- This initiative **aims to provide pilot connectivity, including Internet, medical, and educational services, to these tribal-dominated areas.**
- The proposal was part of a **larger discussion on empowering tribal communities**, which also explored potential projects with other leading institutes like **AIIMS Delhi, IIT Delhi, IIM Calcutta, and IISc Bengaluru**, chaired by **Tribal Affairs Minister Arjun Munda.**

V-SAT stations (very small aperture terminal):

- The government plans to collaborate with **ISRO** to establish **V-SAT stations in 80 geographically remote and difficult-to-access tribal villages, aiming to overcome connectivity challenges** these areas face.
- This pilot project, part of a broader **initiative to promote tribal development and e-governance in remote locations**, will be closely monitored for potential expansion to additional **tribal villages across other states.**
- The selection of these **80 villages** across **Jharkhand, Madhya Pradesh, Odisha, and Maharashtra** is underway, with the project's specifics to be determined soon.

Other initiatives:

- Additionally, the **Tribal Affairs Ministry** is partnering with **AIIMS Delhi** to advance research on **tribal health issues, particularly Sickle Cell Anemia**, and to **organize training for medical staff in tribal regions.**
- There are plans to establish a **Bhagwan Birsa Munda Chair of Tribal Health and Haematology at AIIMS Delhi.**

- Collaborations with **IIT Delhi** and **IIM Kolkata** are also in the works to create a department for **Appropriate Technology and Entrepreneurship**, while a proposal with the **Indian Institute of Science, Bengaluru**, aims to establish a **training facility offering semiconductor courses to tribal students**.
- One other proposal was also tabled to collaborate with the **Indian Institute of Science in Bengaluru** for setting up a **training facility** which will offer courses on **semiconductors to tribal students**.

Oldest 'dead galaxy' yet is spotted by James Webb Telescope

Section: Space sector

Context:

- A significant discovery by **JWST** includes **observations of a galaxy** that had **ceased star formation when the universe was merely 5% of its current age**.

Key Findings about the 'dead galaxy':

- Scientists announced that **JWST** had observed a **galaxy** that became 'dead' approximately **13.1 billion years ago**, around **700 million years post-Big Bang**.
- This marks it as the **earliest dead galaxy** found by about **500 million years**.
- The study suggests the **galaxy underwent a brief star formation burst** lasting **30 to 90 million years** before stopping. The reasons for this cessation are currently under investigation.
 - **JWST's** advanced capabilities allow it to **observe greater distances**—and thus **further back in time**—than the **Hubble Space Telescope**. This has led to the discovery of the **earliest-known galaxies**, revealing them to be larger and more numerous than previously expected.
- **Galaxy Characteristics:**
 - This galaxy experienced a **short, intense period of star formation** before halting abruptly. With an estimated population of **100 million to one billion stars**, the galaxy is considered **relatively small**.
 - After the **halt in star formation**, galaxies evolve into what can be likened to **stellar graveyards**. As **stars die without replacement**, the **galaxy's colour transitions** from **blue** (indicative of hot, massive stars) to **yellow**, then **red** (indicative of less massive stars). The most massive stars, which live the shortest lives, die first in a hierarchical fashion based on stellar weight.
- **Significance of the discovery:**
 - The discovery is particularly intriguing given the **active and violent state of the early universe**, which had **abundant gas to fuel star formation in galaxies**. The abrupt cessation of star formation in such a galaxy poses a significant puzzle.
 - This discovery underscores **JWST's pivotal role in advancing our understanding of the universe's early days**, revealing phenomena that challenge current cosmological models and theories.

What the success of Gaganyaan could mean for Indian science

Section: Space sector

Context:

- India earlier this month revealed the names of the **four Air Force officers** selected for the **Gaganyaan Mission**, the country's maiden attempt at sending humans into Space.

More on news:

- Scheduled for launch next year, it would have the first Indian astronauts in **40 years and the first ones to go on an Indian spacecraft**.
- Just three countries – **the United States, Russia and China** – have executed human spaceflight missions till now.

Why India wants to have a stake in Space technologies

- **Becoming an active participant in this new-age Space exploration** would ensure access to rights, resources and new technologies.
- India could then **build expertise and opportunities for these technologies' early adoption**.
- Space programmes in the past have also **resulted in hundreds of important spin-off technologies, including some breakthrough interventions in the health and medicine sector like Magnetic Resonance Imaging (MRI), heart implants, and advanced water filtration**.

The need to avoid technology denial

- **India has suffered in the past because of the technology denial policies** of other countries, with access to technology often used as a blackmail measure.
- For example, in the 1990s, the US denied India cryogenic technology that is critical for powering rockets.
- It slowed down India's Space programme by almost two decades.
- After **India conducted its nuclear tests in 1998, even basic parts, like certain kinds of transistors and semiconductors, were denied due to economic sanctions.**
- The covid-19 pandemic came as another shock when it was realized that even basic items **like Personal Protective Equipment (PPE) kits and medicines** needed to be procured from abroad.

New science and technology projects announced by India:

- The government has announced separate missions on green hydrogen, quantum computing, and the **latest one last week on artificial intelligence.**
- India has joined some of the biggest international scientific projects like the **Laser Interferometer Gravitational-Wave Observatory (LIGO) and the Square Kilometer Array**, which would involve building several facilities within the country.

About Gaganyaan:

- **Gaganyaan is an ISRO mission** aiming to send Indian astronauts to low-Earth orbit using an Indian launch vehicle.
- It is a demonstration mission to **test technologies essential for human spaceflight, showcasing India's capability in producing, qualifying, and utilizing these technologies.**
- Future goals for ISRO include establishing an **indigenous space station by 2035 and landing an Indian on the moon by 2040.**
- ISRO plans to integrate these ambitious projects with future lunar explorations, **starting with a joint mission with Japan for lunar rover landing and a mission to return lunar soil samples to Earth.**
- The Indian government has expanded spaceflight and services responsibilities beyond **ISRO to New Space India Ltd. (NSIL) for commercialization and the Indian National Space Promotion and Authorization Centre (IN-SPACe) for authorizing space activities.**
- Additionally, ISRO has established the **Human Space Flight Centre (HSFC) to coordinate the Gaganyaan mission.**

It also promised to launch a new scheme for promoting deep-tech capabilities in the defense sector.

Why has India developed an atmospheric testbed near Bhopal?

Section: Space sector

Context:

- On March 12, the **first phase of India's Atmospheric Research Testbed in Central India (ART-CI) was inaugurated at Silkheda in Sehore district**, located about 50 km northwest of Bhopal in Madhya Pradesh.

More on news:

- Funded by the **Ministry of Earth Sciences (MoES)**, the facility will house 25 high-end meteorological instruments for studying vital cloud processes associated with the monsoons over central India's Monsoon Core Zone (MCZ).

What is the Atmospheric Research Testbed (ART)?

- The ART is an open-field, focused observational and analytical research programme at Silkheda.
- The facility aims to conduct ground-based observations of weather parameters like temperature, wind speeds, etc. and in-situ (on-site) observations of the transient synoptic systems – like low-pressure areas and depressions that form in the Bay of Bengal – during the southwest monsoon season from June to September.
- The setup at ART will also be used for calibrating and validating various satellite-based observations, part of weather predictions and forecasting.
- Spread over 100 acres, the **ART has been developed by the Ministry of Earth Sciences** for Rs 125 crore.
- The **Indian Institute of Tropical Meteorology (IITM), Pune**, is in charge of the operations.
- Under the first phase, **remote sensing-based and in-situ measurements using 25 meteorological instruments have commenced.**
- In the second phase, **ART will deploy instruments such as a radar wind profiler and balloon-bound radiosonde, and soil moisture and temperature measuring equipment.**

Why is having an Atmospheric Research Testbed important?

- At present, **45% of India's labor force** is employed in the agriculture sector.

- Much of **Indian agriculture is rainfed**, as is cultivation along the **Monsoon Core Zone (MCZ)**, which spans the central India region from Gujarat to West Bengal.
- The southwest monsoon season accounts for **70 percent of the country's annual average rainfall** (880mm).
- Throughout India, the majority of **Kharif cultivation is undertaken between July and August**, which see an average monthly rainfall of 280.4mm and 254.9mm (1971–2020 average), respectively.
- During this **four-month-long season**, several **rain-bearing synoptic systems**, namely the low pressures or depressions, develop in the **Bay of Bengal**.
- Inherently, these systems move westwards/northwestwards over to the Indian mainland and pass through the **MCZ, causing bountiful rainfall**.

Why is it important to have data about monsoons over central India?

- Studies have correlated the **all-India rainfall performance to the rainfall received over the central India region, highlighting its importance**.
- The **India Meteorological Department (IMD)** issues rainfall forecasts for the country's four homogeneous regions – north, west, east and south peninsular India.
- It issued a **special rainfall forecast for the MCZ**, which is considered India's food bowl.
- **Central India, therefore, acts as a natural laboratory for scientists and meteorologists** to perform a hands-on study of the Indian monsoons.
- They can record data and make observations about the **allied systems, clouds, and other associated physical and atmospheric parameters**.
- Additionally, **climate change is driving erratic rainfall patterns in the tropical regions, like India**.
- It has also strengthened the **low-pressure systems**, which are **aided by high temperatures**.
- This results in **very heavy rainfall recorded along their trajectory during the monsoons**.
- Now, with ART, scientists will be able to generate and obtain long-term observations on cloud microphysics, precipitation, convection, and land-surface properties, among a host of other parameters.
- This information will be assimilated and fed into the numerical weather models to enhance forecast output, especially the rainfall forecasts.
- **More accurate forecasts will ultimately help the farming community** plan their activities better.

Why Madhya Pradesh?

- The ART has been established at **Silkhedra, a location that falls directly in line with the path of major rain-bearing synoptic systems**.
- This will **facilitate direct monitoring and tracking**.
- Besides, the locality is pristine and **free of anthropogenic and other pollutants, making it the best site in central India for setting up sensitive, high-end meteorological instruments and observatories for recording data**.

What instruments are ART equipped with?

- To obtain **continuous observations of convection, clouds, and precipitation, and monitor the major modes of variabilities, the ART is equipped with over two dozen high-end instruments, radars and more**.
- At 72 meters, **ART will house India's tallest meteorological tower**.
- Some of the instruments deployed are an **aethalometer for performing aerosol studies, a cloud condensation nuclei counter, a laser ceilometer to measure cloud sizes, a micro rain radar to calculate raindrop size and its distribution, and a Ka-band cloud radar and a C-band doppler weather radar to help track the movement of rain-bearing systems over this zone**.

IceCube: the big, chill neutrino-spotter

Section: Space sector

Context:

- Recently, scientists have made a **significant breakthrough by identifying instances of tau neutrino interactions within IceCube's data spanning from 2011 to 2020, achieving over 99.999999% confidence in their findings**.
- This discovery underscores the **observatory's invaluable contribution to our understanding of neutrinos and the broader universe**.

Details of the findings:

- **Neutrinos**, often termed "**ghost particles**," are known for their **minimal interactions with matter**.
- The detection of these particles is challenging, with estimates suggesting a **human-sized neutrino detector** might only encounter a single neutrino interaction per century.
- The **vast collecting area of IceCube** significantly **enhances the likelihood of neutrino detection**.
- When **neutrinos interact** with the **ice near the sensors**, they can **generate charged particles and radiation**, which the **sensors detect**.
- By analyzing the **radiation's properties**, scientists can **deduce the presence of a neutrino** and **gain insights into its characteristics**.
- **IceCube** is capable of identifying **certain types of neutrinos in real-time**, while for others, it **amasses data over years** for **subsequent analysis by researchers**.

About IceCube Neutrino Observatory:

- The **IceCube Neutrino Observatory**, situated at the **South Pole (Amundsen–Scott South Pole Station in Antarctica)**, is a **cutting-edge facility** dedicated to **detecting neutrinos, subatomic particles known for their elusive interactions with matter**.
 - Similar to its predecessor, the **Antarctic Muon And Neutrino Detector Array (AMANDA)**, **IceCube** consists of **spherical optical sensors** called **Digital Optical Modules (DOMs)**, each with a **photomultiplier tube (PMT)** and a **single-board data acquisition computer** which sends digital data to the counting house on the surface above the array.
 - **IceCube** was completed on **18 December 2010**.
- Managed by the **IceCube Collaboration**, led by the **University of Wisconsin, Madison**, and involving **numerous global universities**, this observatory plays a **pivotal role in neutrino research**.
- Structurally, **IceCube** comprises thousands of **sensors** buried over **1.4 kilometers** beneath the **ice surface**, alongside additional **detectors located above ground**.
- This extensive sensor network, spread across a **cubic kilometre of ice**, constitutes the **world's largest neutrino telescope**.

VSSC, ISRO develop the multi-purpose app SAKHI to assist the Gaganyaan crew

Section: Space

About Space-borne Assistant and Knowledge Hub for Crew Interaction (SAKHI) App:

- **Developed by: Vikram Sarabhai Space Centre (VSSC)**, the **Indian Space Research Organisation (ISRO)** facility at **Thumba in Thiruvananthapuram**.
- **Purpose of the App: A multi-purpose app** that will **help astronauts on the Gaganyaan space flight mission carry out a range of tasks** such as **looking up vital technical information** or **communicating with one another**.
 - It will also monitor the health of the astronauts, help them stay connected with Earth and even alert them about their dietary schedules.

Vikram Sarabhai Space Centre (VSSC):

- **VSSC** is a major space research centre of the **Indian Space Research Organisation (ISRO)**, focusing on **rockets and space vehicles for India's satellite programme**. It is located in **Trivandrum**, in the Indian state of **Kerala**.
- The centre had its beginnings as the **Thumba Equatorial Rocket Launching Station (TERLS)** in **1962**. It was renamed in honour of **Vikram Sarabhai**, often regarded as the father of the Indian space program.
- **VSSC** is an **entirely indigenous facility** working on the **development of sounding rockets, the Rohini and Menaka launchers**, and **SLV, ASLV, PSLV, GSLV and GSLV Mk III** families of launch vehicles.

Gaganyaan Mission:

- The Gaganyaan Mission is **India's ongoing project to send a 3-day manned mission to the Low Earth Orbit (LEO) of 400 km** with a **crew of 3 members** and **bring them safely back to Earth**.
- As part of this program, **two unmanned missions** and **one manned mission** are **approved** by the **Government of India**.
- The **first manned spaceflight** is expected to take place in **2024**. The success of the Gaganyaan Mission will put India in the elite group of nations (US, Russia, and China) having human space flight capability.
- **Objectives of Gaganyaan Mission**
 - **To undertake human space flights:** Its immediate aim is to demonstrate indigenous capability to undertake human space flights.

- **Space exploration:** In the long run, it will lay the foundation for a sustained Indian human space exploration programme.

T.N. start-up to launch its first rocket on Friday

Section: Space sector

Agnibaan Sub Orbital Technology Demonstrator (SOrTeD):

- **Tamil Nadu's space start-up, Agnikul Cosmos Private Limited**, headquartered in **Chennai**, is scheduled to launch its **first rocket, Agnibaan Sub Orbital Technology Demonstrator (SOrTeD)**, from **Satish Dhawan Space Centre in Sriharikota, Andhra Pradesh**, on March 22.
- **Mission Goals:** The mission **aims** to validate various systems necessary for orbital flight, except stage separation, with plans for post-flight analysis to prepare for future orbital launches.

Details:

- It marks **India's first rocket launch from a private launchpad**.
- It will be **powered by India's first semi-cryogenic engine**.
- The launch will feature the **world's first single-piece 3D printed engine**, which is designed and **built indigenously**.
- **This launch represents:**
- **India's first liquid oxygen-kerosene rocket flight**.
- The **first use of a patented, integrated single-piece 3D printed rocket**.
- A **sub-orbital launch** with advanced features like **closed-loop feedback guidance** and control with a **gimballed thrust vector control**, requiring **flight termination systems** and **extensive safety preparations**.

About Agnikul Cosmos:

- Founded in **2017** by **Srinath Ravichandran, Moin SPM, and Satya Chakravarthy**, Agnikul Cosmos is the **first company** to sign an agreement with **ISRO** under the **IN-SPACe** initiative in **December 2020**, allowing it access to ISRO's expertise and facilities.

Tamil Nadu's Role in Space Sector:

- **Tamil Nadu** has significantly contributed to the space sector, with **numerous companies and MSMEs supplying parts for major ISRO projects like Chandrayaan-3**.
- Entities like **Data Patterns** and **L&T** have established strong presences in the state, contributing to ISRO's missions.
- **TIDCO** is enhancing the state's space sector by establishing two new space parks in **Kulasekarapattinam**, focusing on **space-related manufacturing and propellant production**.

Mission Prarambh- Vikram-S rocket:

- In **2022**, **India's first privately developed rocket** was launched named **Vikram-S**, by **Skyroot Aerospace**, marking a growing trend of private sector involvement in India's space endeavours. This mission was titled "**Prarambh**".

NASA craft that diverted space rock also dented it

Section: Space

Context:

- **NASA's DART spacecraft** successfully **altered the trajectory and shape** of the **asteroid Dimorphos** in **2022**, demonstrating a potential method to **protect Earth from celestial threats**.

Details:

- **Pre-collision, Dimorphos** resembled a **plump ball**; post-impact, its shape changed to resemble a watermelon or a **triaxial ellipsoid**.
- **Dimorphos** is a **moonlet** of the **near-earth asteroid Didymos**, though neither poses a threat to Earth.
- The **collision** occurred on September 26, 2022, with the **spacecraft hitting Dimorphos at about 22,530 kph**, about **11 million km from Earth**.
- **Dimorphos** is approximately **170 metres wide**, while **Didymos** measures about **780 metres in diameter**.
- The impact altered **Dimorphos's orbital path** around **Didymos** to become **elliptical and reduced its orbital period by 15 seconds**, indicating a faster completion of its orbit post-impact.
- The **asteroid's orbital period** has continued to **decay slowly** due to the **leakage of loose debris from the system**, carrying **angular momentum and contracting the orbit**.

DART Mission:

- **NASA's DART mission** was a spacecraft designed to test a method of deflecting an asteroid for planetary defense, using the **"kinetic impactor" technique** (in simplest terms means smashing a thing into another thing).
- **DART** was the **first-ever space mission** to **demonstrate asteroid deflection** by **kinetic impactor**.
- The target of the spacecraft was a **160-meter-wide asteroid** known as **Dimorphos**, which is a **moonlet** in orbit around the larger asteroid, **Didymos**.
- It was launched in **November 2021**.
- It is the first time humanity intentionally changed the motion of a celestial object in space.

ISRO successfully conducts second Pushpak RLV landing experiment

Section: Space tech

Context:

- **The Indian Space Research Organisation (ISRO)** said it successfully conducted the landing experiment of **Pushpak Reusable Launch Vehicle (RLV)** at **Aeronautical Test Range in Chitradurga** district in Karnataka.

More on news:

- Back in 2016, the space agency conducted the maiden **test flight of RLV Demonstrator at Satish Dhawan Space Centre at Sriharikota in Andhra Pradesh**.
- The experiment involved sending a winged spacecraft on a **rocket powered by conventional solid booster (HS9) engine used by ISRO into space**.
- The spacecraft travelled at a speed of **Mach 5 (five times the speed of sound)** when re-entering the earth's orbit and travelled a distance of 450 km before splashdown in the Bay of Bengal.
- It was **ISRO's first attempt to develop** a space vehicle that can fly numerous times into space like airplanes.

About Pushpak Reusable Launch Vehicle (RLV):

- The winged vehicle called **Pushpak landed precisely on the runway after being released from 4.5-kilometre altitude**.
- This is ISRO's second series of RLV landing experiments and this time, the RLV exhibited autonomous landing capability and undertook more difficult maneuvers with dispersions.
- The high-speed landing conditions and approach used by RLV while returning from space was simulated during the mission.
- ISRO conducted a series of **experiments with RLV-TD**.
- It was part of efforts at **developing essential technologies for a fully reusable launch vehicle to enable low-cost access to space**.
- ISRO's RLV-TD, looking like an aircraft, consisted of a fuselage, a nose cap, double delta wings, and twin vertical tails.

IAU approves 'Station Shiv Shakti' as name for Chandrayaan-3 landing site

Section: Space sector

Context:

- The **International Astronomical Union (IAU) working group for Planetary System Nomenclature** has approved the name **'Station Shiv Shakti'** for the landing site of Chandrayaan-3's Vikram lander. The approval was given on **March 19, 2024**.

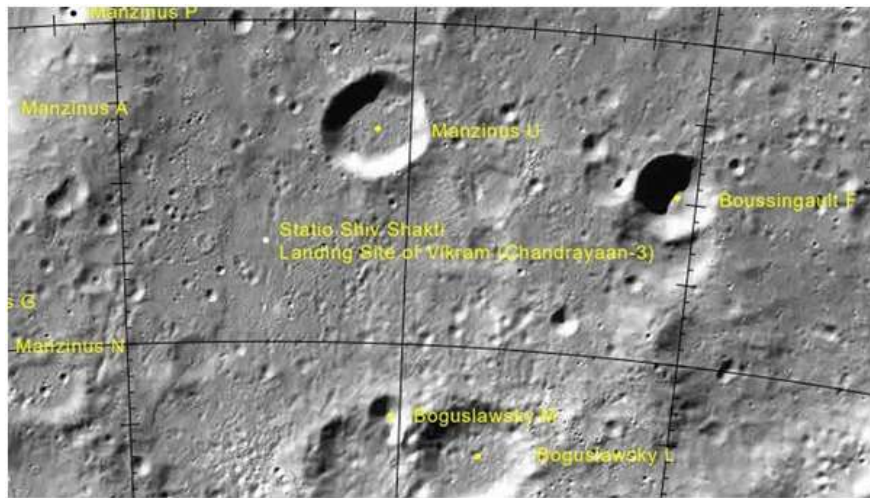
More on news:

- According to the **Gazetteer of Planetary Nomenclature**, planetary nomenclature, like terrestrial nomenclature, is used to **uniquely identify** a feature on the surface of a planet or satellite so that it can be easily located.
- **Rule 4 states that Solar system nomenclature should be international in its choice of names. Recommendations submitted to the IAU national committees will be considered, but final selection of the names is the responsibility of the International Astronomical Union.**
- Mr. Modi had earlier named the point at which the lander of the Chandrayaan-2 mission had crashed in September 2019 **"Tiranga point"**. **Former President A.P.J. Abdul Kalam suggested the name "Jawahar Point" for where the Chandrayaan-1 moon impact probe landed in November 2008.**

Name announced by PM Modi

- The Astrogeology Science Centre of the U.S. Geological Survey maintains the Gazetteer of Planetary Nomenclature on behalf of the IAU with funding from the National Aeronautics and Space Administration (NASA).
- On August 26, 2023 Prime Minister Narendra Modi announced that the point where the moon lander of **Chandrayaan-3 touched down will be called 'Shiv Shakti'**.
- The point where the moon lander of Chandrayaan-3 landed will now be known as Shiv Shakti.

- In **Shiv**, there is **resolution for the welfare of humanity** and Shakti gives us strength to fulfill those resolutions.
- This **Shiv Shakti point of the moon** also gives a sense of connection with **Himalaya to Kanyakumari**.
- **IAU's Rule 9** states that **No names having political, military or religious significance** may be used, except for names of political figures prior to the **19th century**.
- The International Astronomical Union (IAU) working group for **Planetary System Nomenclature** has approved the name '**Statio Shiv Shakti**' for the landing site of **Chandrayaan-3's Vikram lander**.
- According to the **Gazetteer of Planetary Nomenclature**, **planetary nomenclature**, like terrestrial nomenclature, is used to uniquely identify a feature on the surface of a planet or satellite so that it can be easily located, described, and discussed.
- The **IAU is the internationally recognized** authority for assigning names to planetary surface features.
- It follows **some rules and conventions to do so**.



Apple, Google, Meta targeted in EU's first Digital Markets Act probes

Section: Space sector

Context:

- **The European Union is investigating Apple, Google, and Meta** for potential violations of the **new Digital Markets Act**, which aims to curb the power of big tech companies and create a more level playing field for smaller businesses.

More on news:

- **The European Union law, effective from March 7, aims to challenge the power of the tech giants by making it easier for people to move between competing online services like social media platforms, internet browsers and app stores.**
- That should in turn open up space for smaller companies to compete.
- Violations could result in fines of as much as 10% of the companies' global annual turnover. U.S. antitrust regulators are also challenging Big Tech over alleged anti-competitive practices in a crackdown that could even lead to companies being broken up.

Apple Compliance:

- At issue is whether **Apple complies with obligations** to allow users to easily uninstall software applications on its iOS operating system, to change default settings on iOS or access choice screens allowing them to switch to a rival browser or search engine on iPhones.
- Another concern for regulators is "steering": whether Apple imposes limitations that hinder app developers from informing users about offers outside its App Store free of charge.
- The EU executive, which aims to wrap up the investigations within a year, the timeframe set out under the DMA, said it has ordered the companies to retain certain documents, allowing them to access relevant information in its current and future probes.
- The **EU investigations came amid escalating criticism** from apps developers and business users about shortcomings in the companies' compliance efforts.

Digital Markets Act

- It applies to the '**gatekeepers**' in the online space. These companies will have to comply with the new rules.

- The Digital Markets Act (DMA) entered into force in the **European Union (EU)** on November 1 2022.
- It introduces **quantitative thresholds and penal provisions** to keep a check on large digital platforms.
- It opens up possibilities of an **equal market** – based on the merits of their products and services.
- As for **consumers it ensures access to a wider array of options as well as a lower price** of services by enforcing competition and de-exclusivities.
- The Act designates companies with sizeable dominance in any of the **‘core platform services’ as ‘gatekeepers’**.
 - These **services** include app stores, online search engines, social networking services, certain messaging services, video sharing platform services, virtual assistants, web browsers, cloud computing services, operating systems, online marketplaces and advertising services.
- **What is the quantitative threshold to be deemed a ‘gatekeeper’?**
 - an annual turnover of at least €7.5 billion within the EU in the past three years, or a market valuation of at least €75 billion
 - over 45 million monthly end-users
 - at least 10,000 business users established in the EU.
- The rules state that users will have the **right to choose and install their apps and will not be forced to use software** by default when installing the OS and web browsers.
- It provides “interoperability”–mean that a user on WhatsApp and one on iMessage should be able to talk to each other
- **Obligations on gatekeepers:**
 - Gatekeepers must “allow the installation and effective use of third party software applications or software application stores”.
 - Gatekeepers cannot establish unfair conditions for business users or require app developers to use certain services in order to be listed in app stores.
 - Gatekeepers will have to give sellers access to their marketing or ad performance data on the platform.
 - The gatekeepers will have to inform the European Commission of their acquisitions and mergers.
 - The new rules also forbid the gatekeepers from ranking their own products or services higher than others, and from reusing private data collected during a service for the purposes of another service.
 - A proportionate subset of obligations for a non-gatekeeper, attains the stipulated threshold in the future to prevent them from acquiring the same ‘gatekeeper dominance’ by unfair means.
- **What happens when rules are violated?**
- Violators can be fined up to 10 percent of the company’s global annual sales, rising to 20 per cent for repeated infringements.
- In worst case scenarios, they could even be banned from any further acquisitions

Agnikul's maiden test launch of Agnibaan Sorted mission postponed

Section: Space sector

Context:

- The **Agnibaan SOrTeD (Suborbital Tech Demonstrator)** was scheduled for a test-fire on Friday from a dedicated launch pad at Sriharikota.

More on news:

- The much-anticipated launch of the **Agnibaan SOrTeD rocket by Chennai-based space startup Agnikul Cosmos** has been postponed.
- **Agnikul Cosmos** has been at the forefront of India's burgeoning private space sector

About Agnibaan:

- The **Agnibaan SOrTeD (Suborbital Tech Demonstrator)** was scheduled for a test-fire on Friday from a dedicated launch pad at Sriharikota.
- This mission was set to mark several firsts for India - **it would have been the country's first launch from a private launch pad, utilizing the world's first single-piece 3D printed engine**, the Agnilet, designed and built indigenously by Agnikul.
- The **rocket, weighing 580 kilograms, aimed to reach an altitude of 20 kilometers above the Earth before descending into the Bay of Bengal, carrying up to 7 kg of payloads.**
- **Agnikul Cosmos has been at the forefront of India's burgeoning private space sector**, with ambitions to provide customisable and transportable launch vehicles for small satellites to Low Earth Orbits (LEO).

- The **Agnibaan rocket**, capable of carrying up to **100kg** to orbits around **700 km high**, represents a significant step towards achieving this goal.
- Its **unique propulsion system**, powered by a semi-cryogenic engine using **Aircraft Turbine Fuel and liquid oxygen**, sets a **new standard in the industry**.

Kalam-250

Section: Space technology

Context: Leading space-tech company Skyroot Aerospace on Wednesday successfully test-fired the stage-2 of its Vikram-1 launch vehicle at the propulsion testbed of the Indian Space Research Organisation (ISRO) at Satish Dhawan Space Centre (SDSC) in Sriharikota, Andhra Pradesh

What is Kalam-250?

- It is a stage-2 of Vikram-1 space launch vehicle.
- It is a high-strength **carbon composite rocket motor**, which uses solid fuel and a high-performance **Ethylene-Propylene-Diene terpolymers (EPDM)** thermal protection system (TPS).
- The stage includes a carbon **ablative flex nozzle** along with high-precision electro-mechanical actuators for thrust vector control of the vehicle, aiding in achieving the desired trajectory.
- The solid propellant in Kalam-250 was processed by Solar Industries at their Nagpur facility.
- The second stage of Vikram-1 will play a crucial role in the ascent of the launch vehicle, propelling it from the atmosphere to the deep vacuum of outer space.

Key features of Vikram-1 Rocket:

- It is a multi-stage launch vehicle with a capacity to place around 300 kg of payloads in **low-earth orbit**.
- It has been built by Hyderabad-based Skyroot Aerospace.
- It is an all-**carbon-fibre-bodied** rocket that can place multiple satellites into orbit.
- Being a solid-fuel rocket and using relatively simpler technologies would mean that launching this vehicle would

Vikram-1

Vikram-1 launch will be a landmark event for the Indian space sector as it will be the country's first private orbital rocket launch.

Features of Vikram-S launch vehicle-

- **Skyroot** was the **first startup** to sign a **memorandum of understanding** with **ISRO** for launching its rockets.
- Its launch vehicles have been crafted especially for the **small satellite market**.
- They come in **three forms, Vikram I, II, and III**.
- More than **20,000 small satellites** are estimated to be launched in the coming decade, and the **Vikram series** is designed to enable this through unprecedented mass production and affordability.
- Vikram-S offers many services like **multi-orbit insertion**, and **interplanetary missions**; while providing **customised, dedicated** and **ride-share options** covering a wide spectrum of small satellite customer needs.
- **Skyroot claims** a **Vikam rocket** can be **assembled and launched within 24 hours** from any launch site and has the "**lowest cost in the payload segment**".

CSE 2025

AIMING FOR THE TOP RANK IN CSE 2025

JOIN THE BEST MENTORSHIP PROGRAM

(The only program with Daily Target & Daily Answer writing)



Ishita Kishore
ALL India Rank 1

LAQSHYA Prelims Mentorship Student
Mains Master Notes Program Student

Book one to session with
Santosh sir
82350 35144



Prepare under
Santosh Sir
All 6 Pre Qualified
4 Mains Qualified
State PCS Qualified
Ex Deputy Collector

To Be The Best
Learn From The Best

OPTIMIX