

CURRENT AFFAIRS

WEEKLY

WEEK: 3
OCTOBER
2022

MAINS

GS-II

- REGULATION OF THE DIGITAL ECOSYSTEM IN INDIA
- ELECTORAL BONDS: SC QUESTIONS THE TRANSPARENCY OF THE PROCESS
- SC DELIVERS SPLIT VERDICT ON KARNATAKA HIJAB BAN
- INDIA'S INCREASING POPULATION AND POLICY MEASURES REQUIRED TO TACKLE IT
- MAKING A CASE FOR THE OLD PENSION SCHEME TO BE MORE INCLUSIVE
- CHINA'S WOLF-WARRIOR DIPLOMACY

GS-III

- CYBER-ATTACK BECOMES A NEW WEAPON FOR THE MODERN WORLD
- ECONOMICS NOBEL HAS LESSONS FOR INDIA'S MACRO-ECONOMIC POLICY THOUGHT
- GLOBAL HUNGER INDEX, 2022 SHOWS A 'SERIOUS' SITUATION FOR INDIA
- TOKENIZATION AND PREVENTION OF ONLINE CARD FRAUD
- ORGANIC FERTILISER IN AGRICULTURE AND WAY TO SUSTAINABLE FUTURE
- BALANCING CLIMATE CHANGE AND GLOBAL NUTRITION
- GREEN INVESTMENTS AND SUSTAINABILITY
- LIVING PLANET REPORT 2022

PRELIMS

ART & CULTURE

- Hampi, Khajuraho and other UNESCO sites on list for G20 culture track

INTERNATIONAL RELATIONS

- Solar Alliance approves funding mechanism
- Russia joins the race to supply light battle tanks to the Indian Army
- The Interpol General Assembly meeting held in Delhi

POLITY AND GOVERNANCE

- President Droupadi Murmu flags off Tripura-Manipur train
- Indian Railways announces the closure of COFMOW

ECONOMY

- Global Multidimensional Poverty Index released
- Strengthening dollar and impact on Forex reserves

- PM Modi inaugurates 'One Nation, One Fertilizer' scheme

SCIENCE AND TECHNOLOGY

- INS Arihant validates India's nuclear capability
- Researchers detect barium in atmospheres of 2 exo-planets
- GSLV Mk-III to launch '36 One Web' satellites
- ISRO's next-Gen Launch Vehicle
- The illusion of being faster than light: how a star problem was solved

ENVIRONMENT

- Can carbon capture be new hope for mitigating CO2 emissions?
- 76 butterfly species counted across 7 biodiversity parks in Delhi

QUICK BYTES

- International E-Waste Day
- Six spider species discovered across the country
- Six varieties of neelakurinji identified in Western Ghats
- 12th edition of DefExpo to begin in Gujarat
- Japan seeks GI tag for nihonshu, an alcoholic beverage

SPECIAL

- Mission Karmyogi: An attempt to change the face of civil services

GS SCORE

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— **Disclaimer** —

The current affairs articles are segregated from prelims and mains perspective, such separation is maintained in terms of structure of articles. Mains articles have more focus on analysis and prelims articles have more focus on facts.

However, this doesn't mean that Mains articles don't cover facts and PT articles can't have analysis. You are suggested to read all of them for all stages of examination.

CONTENTS

WEEK - 3 (OCTOBER, 2022)

Section - A: MAINS CURRENT AFFAIRS			
Area of GS		Topics in News	Page No.
GS II	POLITY AND GOVERNANCE	● Regulation of the Digital Ecosystem in India	02
		● Electoral bonds: SC questions the transparency of the process	03
		● SC delivers split verdict on Karnataka hijab ban	04
		● India’s increasing population and Policy measures required to tackle it	06
		● Making a case for the Old Pension Scheme to be more inclusive	07
	INTERNATIONAL RELATIONS	● China’s Wolf-Warrior Diplomacy	09
GS III	INTERNAL SECURITY	● Cyber-attack becomes a new weapon for the modern World	10
	ECONOMY	● Economics Nobel Has Lessons for India’s Macro-Economic Policy Thought	11
		● Global Hunger Index, 2022 shows a ‘serious’ situation for India	12
		● Tokenization and prevention of online card fraud	14
	ENVIRONMENT	● Organic fertiliser in Agriculture and way to sustainable Future	15
		● Balancing climate change and global nutrition	17
		● Green Investments and Sustainability	19
		● Living Planet Report 2022	21
Section - B: SPECIAL			
Topics in News			Page No.
GS II	● Mission Karmyogi: An attempt to change the face of civil services		24
Section - C: PRELIMS CURRENT AFFAIRS			
Area of GS		Topics in News	Page No.
GS I	ART & CULTURE	● Hampi, Khajuraho and other UNESCO sites on list for G20 culture track	27
GS II	INTERNATIONAL RELATIONS	● Solar Alliance approves funding mechanism	29

GS II	INTERNATIONAL RELATIONS	● Russia joins the race to supply light battle tanks to the Indian Army	29
		● The Interpol General Assembly meeting held in Delhi	31
	POLITY & GOVERNANCE	● President Droupadi Murmu flags off Tripura-Manipur train	31
		● Indian Railways announces the closure of COFMOW	32
GS III	ECONOMY	● Global Multidimensional Poverty Index released	33
		● Strengthening dollar and impact on Forex reserves	34
		● PM Modi inaugurates ‘One Nation, One Fertilizer’ scheme	36
	SCIENCE & TECHNOLOGY	● INS Arihant validates India’s nuclear capability	37
		● Researchers detect barium in atmospheres of 2 exo-planets	39
		● GSLV Mk-III to launch ‘36 One Web’ satellites	40
		● ISRO’s next-Gen Launch Vehicle	41
		● The illusion of being faster than light: how a star problem was solved	43
	ENVIRONMNET	● Can carbon capture be new hope for mitigating CO2 emissions?	43
		● 76 butterfly species counted across 7 biodiversity parks in Delhi	45
Section - D: QUICK BYTES			
Topics in News			Page No.
ENVIRONMENT	● International E-Waste Day		48
	● Six spider species discovered across the country		48
	● Six varieties of neelakurinji identified in Western Ghats		50
SCIENCE & TECHNOLOGY	● 12th edition of DefExpo to begin in Gujarat		51
	● Japan seeks GI tag for nihonshu, an alcoholic beverage		51

SECTION: A

(MAINS)

CURRENT AFFAIRS

REGULATION OF THE DIGITAL ECOSYSTEM IN INDIA

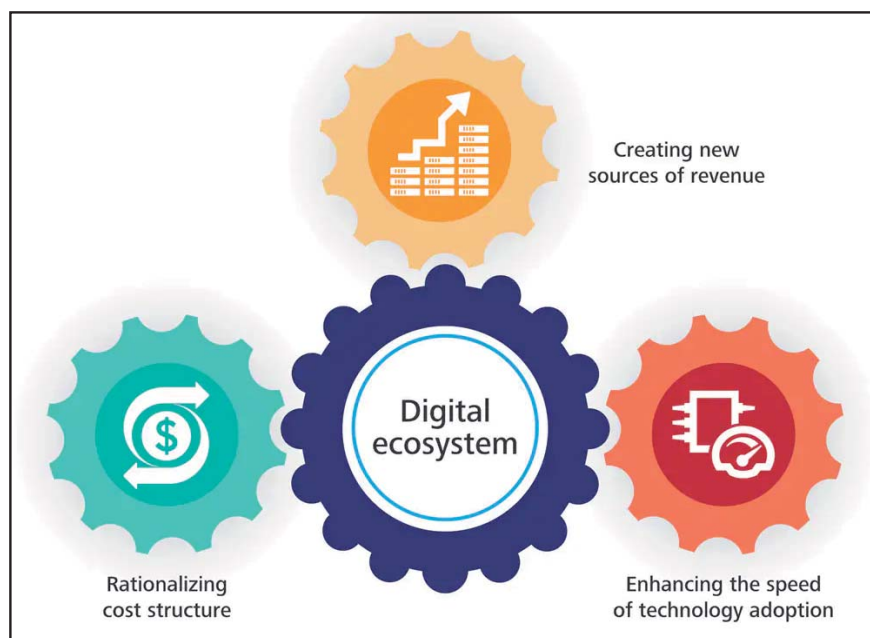
CONTEXT:

Despite several transformative progresses made in the digital payment sphere, it is continuing amid a sea of regulatory uncertainty. Rapid adoption has thrown up the new policy in regulatory challenges.

Why digital ecosystem is on rise?

- Increased penetration of smartphones
- Coronavirus pandemic has further accelerated the process of digital inclusion
- Adoption of Time-Saving Products and Services
- Growing Interest in Customized Products

Digital ecosystem: Social media platforms, OTT platforms, online apps, metaverse and blockchain.



How digital ecosystem is changing India?

- **Jan-Dhan-Aadhaar-Mobile (JAM) trinity:** Ensuring delivery of government schemes to its beneficiaries without leakage or misuse.
- **SVAMITVA Yojana:** Provided digital land records to the rightful owners by leveraging the power of drones and GIS technologies.
- **Bharat Net:** provided high-speed broadband to all the village.
- **Common Service Centers (CSCs):** offering banking, insurance, state and central government services, passport and PAN card services, digital literacy, rural eCommerce services and pre-litigation advice etc.
- **Digital payments revolution:** UPI and Aadhaar-Enabled Payment Systems (AEPS), AEPS-based micro-ATM at CSCs and post offices.

How this growth is posing challenges?

- It raises the need of reasonable safeguards for an inclusive and stable ecosystem.
- Issues arises such as consumer and data protection, privacy, payment safety, etc.

Recent Government measures for regulating the sector:

- In 2022 itself, the Ministry of Electronics and Information Technology (MeitY) has announced the
 - draft amendment to the IT Rules 2021 (June 2022)
 - the draft India Data Accessibility and Use Policy (February 2022)
 - National Data Governance Framework Policy (May 2022)
 - the New cyber security directions (April 2022)
- India is also working on a complete overhaul of its technology policies and is expected to soon come out with a replacement of its IT Act, 2000, which is expected to look at ensuring net neutrality and algorithmic accountability of social media platforms, among other things.

Required Interventions:

- A co-regulation model with components of a statutory oversight body, industry-led self-governance and multi-tiered grievance redressal mechanisms.
- Encouraging innovation and limiting unintended negative consensus.
- Amendments in existing laws as well as allocation of business across ministries.

The Trendsetters:

- **Digital Services Act (DSA):** The European Union (EU) has given final approval to online safety-focused legislation, which is an overhaul of the region's social media and e-commerce rules.
- **US and Australia, also catching up:** The US and Australian initiatives are still brewing, as are those in several other parts of the world. The principles of regulation are mostly aligned, reflecting their unease with the inconceivable growth and influence of Big Tech.

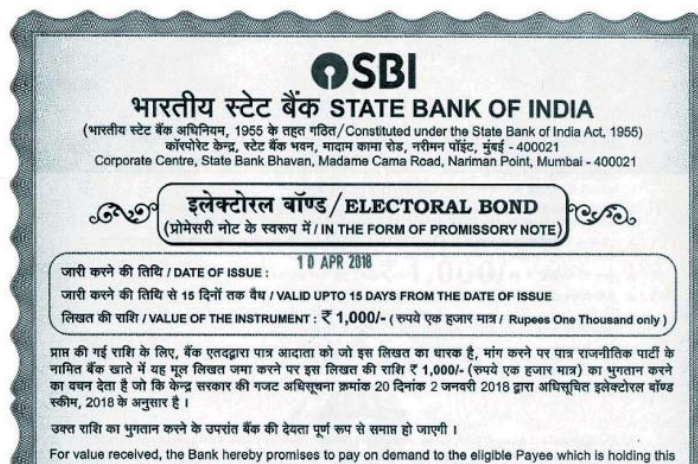
ELECTORAL BONDS: SC QUESTIONS THE TRANSPARENCY OF THE PROCESS

CONTEXT:

Recently, the Supreme Court Justice B R Gavai, heading a Bench, asked the government whether the electoral bonds' system reveals the source of money pumped in to fund political parties.

◎ ABOUT**What are Electoral Bonds?**

- **Introduced:** 2018
- Electoral bonds are **an instrument** through which anyone can **donate money** to political parties.
- Such bonds, which are sold in multiples of Rs.1, 000, Rs.10, 000, Rs.1 lakh, Rs.10 lakh, and Rs.1 crore, can be bought from authorised branches of the **State Bank of India**.
- **Objective:** to bring about transparency in electoral funding in India.



◦ **Process of Donation:**

- ▶ As such, a donor is required to pay the amount — say Rs.10 lakh — via a cheque or a digital mechanism (cash is not allowed) to the authorised SBI branch.
- ▶ The donor can then give this bond (just one, if the denomination chosen is Rs.10 lakh, or 10, if the denomination is Rs.1 lakh) to the party or parties of their choice.

How Political Parties can use these donations?

- The political parties can choose to encash such bonds within **15 days** of receiving them and fund their electoral expenses.
- On the face of it, the process ensures that the name of the donor **remains anonymous. The source of the donations is hence not revealed to voters.**

Why they attract Criticism?

- **Contradicting its Basic Idea:** The scheme does the exact opposite of what it was meant to do i.e. to bring transparency to election funding.
- **Possibility of Extortion:** The fact that such bonds are sold via a government-owned bank (SBI) leaves the door open for the government to know exactly who is funding its opponents.
- **A Blow to Democracy:** Political parties are exempted from disclosing donations received through electoral bonds.
- **Against Free & Fair Elections:** Electoral bonds provide no details to the citizens.

Supreme Courts' Stand:

- The Indian Supreme Court has long held that the "**right to know**", especially in the context of elections, is an integral part of **the right to freedom of expression (Article 19)** under the Indian Constitution.
- However, the **Representation of the Peoples Act, 1951** does not contain any provisions for revealing the source of funding to the voters.

SC DELIVERS SPLIT VERDICT ON KARNATAKA HIJAB BAN

CONTEXT:

Recently, the Supreme Court has delivered a split verdict on whether Muslim Girls/ students should shed their hijabs at the Educational Institutions, again igniting the debate around the Right to profess and follow their religion.

The Verdict

- One judge affirmed that the state government is authorised to enforce uniform in schools and the other called hijab a matter of choice that cannot be stifled by the state.

Essential religious practices mean all those practices that are fundamental to a religion and not following them would result in the change of religion itself.

Supreme Court's (SC) Previous Judgements on Hijab Case:

As per the SC, wearing of hijab does not form a part of **essential religious practices** in Islamic faith and it is not protected under the right to freedom of religion guaranteed under **Article 25** of the Constitution of India.

- The prescription of school uniform does not violate the:
 - ▶ **Right to freedom of speech and expression** under **Article 19(1) (a)**

Divergent views

A look at what was emphasised by the two verdicts on the hijab ban

DELIVERED BY JUSTICE HEMANT GUPTA

"Secularism is applicable to all citizens, therefore, permitting one ... community to wear their religious symbols would be antithesis to secularism."

SCHOOL AND RELIGION: Religion has no meaning in a secular school run by the state. "Students are free to profess their religion and carry out religious activities other than when they're attending a classroom."

UNIFORM, EQUALITY: "... Uniform fosters a sense of 'equality' amongst students- instills a sense of oneness, diminishes individual differences..."

DELIVERED BY JUSTICE SUDHANSHU DHULIA

"Wearing hijab should be simply a matter of choice. It may or may not be a matter of essential religious practice, but it still is, a matter of conscience, belief, expression."

CLASSROOM IS DIFFERENT: Though discipline is required in educational institutions, they can't be put on par with a jail or a military camp, as was cited by HC while describing schools as "qualified public spaces"

TICKET TO EDUCATION: "If it is worn as a matter of her choice, as it may be the only way her conservative family will permit her to go to school... her hijab is her ticket to education"

► **Right to privacy** under **Article 21** of the Constitution

- The restriction against wearing of hijab in educational institutions is only a **reasonable restriction constitutionally permissible**, which the students cannot object to.
- The court upheld the **legality of the Karnataka Government's** order prescribing wearing of uniforms in schools and pre-university colleges under provisions of the **Karnataka Education Act, 1983**.

About Religious Freedom Protected under the Constitution:

- **Article 25(1)** of the Constitution guarantees the "**freedom of conscience and the right freely to profess, practise and propagate religion**".
- It is a right that **guarantees a negative liberty** — which means that the state shall ensure that there is no interference or obstacle to exercise this freedom.
- However, like all **fundamental rights**, the state can restrict the right for grounds of **public order, decency, morality, health and other state interests**.

Key points of Consideration:

- Fundamental Rights of Girls/Students on wearing whatever they want but conditional restrictions over educational Institutions.
- Conservative mind-set of parents/families for girl child to get education. It is a Human right and cannot be seen as constraint under a practice of any religion.
- Judgements to be given for larger good and not only considering a group of people's opinion.

Argument in Support of the Hijab Ban	Argument against Hijab Ban
<ul style="list-style-type: none"> Hijab is not an essential religious practice and the freedom of religion can be subjected to reasonable restrictions under constitutional provisions for maintaining institutional discipline. Educational institutions can impose dress codes/uniforms prohibiting religious dress to ensure secular education. The spirit behind a dress code is of ensuring homogeneity in a classroom and obliterating the visible class or caste divide. 	<ul style="list-style-type: none"> Constitutional Right - Wearing of hijab is their fundamental right. Also wearing a hijab is an expression protected under Article 19. Government has the right to restrict fundamental rights to protect the sovereignty and integrity of India, friendly relations with foreign states, public order, decency or morality, or in relation to contempt of courts. Diversity: India is a land of diversity, and the diversity in the classroom must reflect this social reality, as this helps students to know about different diverse groups and they learn to respect diversity.

INDIA'S INCREASING POPULATION AND POLICY MEASURES REQUIRED TO TACKLE IT

CONTEXT:

Considering the United Nations report showing data about India would surpass China to become the most populous country by 2023, has drawn a debate over the population policy and changes to be made for curbing the future implications.

Mapping India's Population:

- India is **second most populous** country with over 1.35 billion people.
- Approximately 17.85% of the world's population are Indians, which means 1 in every 6 people on Earth live in India.
- India's population is expected to grow by 25%, with reference to 2011, to 1.52 billion by 2036.
- India's population growth rate is expected to decline to its lowest since the Independence in the 2011-2021 decade, with a decadal growth rate of 12.5%.

Current Policy (The National Population Policy, 2000)

- The National Population Policy (NPP), 2000 is the central government's second population policy.
- The NPP states its immediate objective as addressing the unmet needs for contraception, healthcare infrastructure, and health personnel, and providing integrated service delivery for basic reproductive and child healthcare.
- The medium-term objective of the NPP 2000 was to reduce the Total Fertility Rate (TFR) to replacement levels by 2010.
- The TFR was to be **2.1 children per woman**.
- The long-term objective is "to achieve a stable population by 2045, at a level consistent with the requirements of sustainable economic growth, social development, and environmental protection."

Cause of Overpopulation:

- Decline in death rate:** If the number of children born each year equals the number of adults that die, then the population will stabilize.
- Agricultural advancements:** Agricultural advancements have allowed humans to increase food production using fertilizers, herbicides, and pesticides and yields further.
- Better medical capabilities:** Illnesses that had claimed thousands of lives until now were cured because of the

invention of vaccines. Combining the increase in food supply with fewer means of mortality tipped the balance and became the starting point of overpopulation.

- **More hands to work:** Families that have been through poverty, natural disasters, or are simply in need of more hands to work are a major factor for overpopulation.
- **Advanced fertility treatment:** Today there are effective medicines that can increase the chance of conception and lead to a rise in the birth rate. Moreover, due to modern techniques, pregnancies today are far safer.
- **Immigration:** Many people prefer to move to urban areas, where the best facilities are available. The result is that those people settle over there, eventually making those places overcrowded.
- **Lack of family planning/unawareness:** There is a large number of people, who are illiterate, live below the poverty line, and have little or no knowledge about family planning.
- **Poor contraceptives use:** A study by the World Health Organization (WHO) shows that women aged between 16 and 49 used at least one form of contraceptive are 43% in underdeveloped countries, which leads to higher birth rates.

Areas to be focused for Sustainable development:

- **Social security and universal health:** Increasing rate of old age population will demand a better welfare system along with social security and universal health care facility.

According to the **National Commission on Population**, the **share of the elderly in India's population, close to 9% in 2011, is growing fast** and may reach 18% by 2036. If India is to ensure a decent quality of life for the elderly in the near future, planning and providing for it must begin today.

- Demographic liability
- Resource allocation and Achieving SDGs
- Poverty and quality of life

MAKING A CASE FOR THE OLD PENSION SCHEME TO BE MORE INCLUSIVE

CONTEXT:

Recently, after Rajasthan and Chhattisgarh, Punjab has become the latest State that has announced its plan to revert to the Old Pension Scheme (OPS) rather than to apply New Pension system which has attracted several criticisms around the country.

◎ BACKGROUND

- The history of the **Indian pension system** dates back to the colonial period of British-India.
- **The Royal Commission on Civil Establishments**, in 1881, first awarded pension benefits to the government employees.
- The **Government of India Acts of 1919 and 1935** made further provisions.

Increasing population: The number of senior citizens increase – from 10.38 Crore in 2011 to an estimated 17.3 Crore in 2026 and 30 Crore in 2050.

How Pension system works in India?

- All pension plans in India provide guaranteed **maturity benefit**. This is the reason why pension plans in India are also known as **guaranteed pension plans**.

- The maturity benefits are generally the fund value or 101% of Premium paid, whichever is higher.

Old pension Scheme (OPS):	New Pension Scheme
<ul style="list-style-type: none"> • The OPS is an assured inflation-indexed monthly family pension till you (and your spouse) live(s). • The OPS level is linked to the last pay pensioner drew. 	<ul style="list-style-type: none"> • The NPS is a retirement savings scheme to secure the life of an individual financially after retirement. • Its value is determined by the market prices in which the corpus is invested.

What are the issues associated with NPS?

- **Low amount:** The amount of monthly pension one would draw (for the same contribution during service) with three hypothetical market rates of return is significantly lower for NPS.
- **Dependent on market price:** It is dependent on the vagaries of the market prices of equity/bonds in which the corpus is invested. To be sure, the markets do not crash often and in the long run they go up rather than down.
 - If there is a crash, the downside has to be absorbed by the retirees.

According to a 2008 **OECD study**, the global financial crisis had wiped a total of \$5 trillion off the value of **private pension funds** in rich countries compared to the start of the year 2002.

- Following are the major differences between the Old System and NPS:

Description	Old Pension System	NPS (Tier-1)
Contribution of employee	Nil	10% of (Basic Pay plus DA)
Pension guarantee by Government	Yes	No
Amount of pension	50% of last pay drawn	No link with last pay
Dearness Relief provided by Government for mitigating impact of inflation	Yes	No
Amount of commutation allowed	Upto 40%	No option
GPF eligibility	Yes	No
GPF/NPS withdrawal	Temporary: within 15 years Final: after 15 years	Tier-I: Not allowed till May 2015 ³

Why Old pension scheme is getting support from few State governments?

- The OPS is **fixed government expenditure** irrespective of an economic slowdown or a stock market crash, which makes it a good **counter-cyclical policy** measure during a crisis. In fact, the Sixth Pay Commission in India did precisely this during the Great Recession of 2008.

Reasons to shift from Old to New Pension scheme:	Required interventions
<ul style="list-style-type: none"> • Load on government's Expenditure • Scams and Corruption in funds allocated for Pensioners 	<ul style="list-style-type: none"> • Economic and social innovation • Promotion of silver economy

- | | |
|---|--|
| <ul style="list-style-type: none">• Non-inclusion of Employees from Unorganised sector• Out-dated structure and less consideration of fluctuations of Market prices. | <ul style="list-style-type: none">• Innovative models of finance• Social entrepreneurship• Effective public policy |
|---|--|

CHINA'S WOLF-WARRIOR DIPLOMACY

CONTEXT:

With the Chinese Communist Party's (CCP's) 20th National Congress, China's position and its diplomacy with world has been discussed. It saw many changes in world affairs over the years, Xi has advocated for a more intensive approach towards handling issues both domestically and internationally.

- The "wolf warrior" style of Chinese diplomacy particularly attracted attention.

What is Wolf Warrior Diplomacy of China?

- Wolf warrior diplomacy is an aggressive style of diplomacy adopted by Chinese diplomats in the 21st century, under **Chinese leader Xi Jinping's administration**.
- It is confrontational and combative, with its proponents loudly denouncing any criticism of China on social media and in interviews.
- It is considered as 'great diplomatic philosophy' of Xi Jinping.

What is the need for wolf warrior diplomacy?

- The change in strategy has been attributed to many reasons, such as
 - ▶ Xi's more authoritarian tendencies as compared to earlier leaders
 - ▶ deteriorating US-China relations under former US President Donald Trump
 - ▶ the coronavirus pandemic-related accusations on China, etc.

How China is using this Diplomacy against India?

- **Increasing presence:** China's increasing presence and involvement in the Indian Ocean is certainly a strategic and security problem for India.
- **Naval power:** China's overall naval capabilities have exceeded India's. China is continuously developing its naval capabilities and forging partnerships with strategically located states in the Indian Ocean.
 - ▶ For example, in 2017, China established its **first offshore military base in Djibouti** that would provide it with a considerable capacity to monitor the Indian Navy's movements in the Indian Ocean.
- **Enhanced military presence:** The developments of the China-Pakistan Economic Corridor along with Gwadar Port will also provide China with an enhanced military presence in the Indian Ocean region.
- **Influence on neighbours:** With the assertive and ambitious Belt and Road Initiative and Maritime Silk Road, China has consolidated its influence over the Indian neighbours as almost all the neighbour sans Bhutan have shown the keen interests in joining.
 - ▶ Recently, Sri Lankan parliament passes controversial Bill on China-backed Colombo Port City. Hambantota Port is already under China's control.

What should be the way out for India to counter China?

- Strengthening ties with US with initiatives like QUAD
- Increase ties with India Neighbourhood like Bangladesh, Sri Lanka etc.
- Using India's Soft powers and Cultural significance with China.

CYBER-ATTACK BECOMES A NEW WEAPON FOR THE MODERN WORLD

CONTEXT:

With the evolving world, Cyber threat has become one of the most emergent issues which are now seen as ‘Grey Zones Operations’ and creates a threat as it is weaponised by the countries.

Grey-zone Operations:

- ‘**Grey Zone Operations**’ can be broadly defined as the exploitation of operational space between peace and war to change the **status quo** through the use of coercive actions which remain below a threshold that, in most cases, would prompt a conventional military response.

What is Cyber-security?

- **Cyber security** is concerned with making cyberspace safe from threats, namely **cyber-threats**.
- The notion of “**cyber-threats**” implies the malicious use of **information and communication technologies (ICT)** either as a target or as a tool by a wide range of malevolent actors.



What does Weaponisation of Cyberspace mean?

- **Cyber weapon** is usually sponsored or employed by a **state or non-state actor**, meets an objective that would otherwise require espionage or the use of force, and is employed against specific targets.
- A **cyber weapon** performs an action that would normally require a soldier or spy, and which would be considered either illegal or an act of war if performed directly by a human agent of the sponsor during peacetime.
- Legal issues include violating the privacy of the target and the sovereignty of its host nation. Examples of such actions are **surveillance, data theft and electronic or physical destruction**.

Challenges of Cyber Security:

- **Digital Data Threat:** Growing online transactions generate bigger incentives for cybercriminals. Besides, establishments looking to mine data—for instance, customer information, results of product surveys, and generic market information—create treasured intellectual property that is in itself an attractive target.
- **Supply Chain Inter-connection:** The supply chains are increasingly interconnected. Companies are urging vendors and customers to join their networks. This makes a company's security wall thin.
- **Hacking:** This action is penetrating into someone's system in unauthorized fashion to steal or destroy data, which has grown hundred folds in the past few years. The availability of information online makes it easier for even non-technical people to perform hacking.
- **State-sponsored cyber-attacks:** They are typically difficult to track or defend against due to their lack of physical components. Their anonymity allows them to hide in systems undetected until their attack is unleashed. Many of these attacks exploit “**zero days**” (vulnerabilities in software that companies have zero days to fix).

Weapons used: Cybercriminals will use any internet-connected device as a weapon, a target or both, and SMBs tend to deploy less sophisticated cyber security measures.

- Malware attack
- Ransomware
- Trojan
- Password attack
- Ransomware
- DDoS etc.

Sectors those are vulnerable:

- The most targeted sectors: health care, education and research, communications and governments.

Few instances of using Cyberspace as a Weapon:

Arguments in favour	Arguments against
<ul style="list-style-type: none">• For Instance, it has been argued that it was radically not wrong to use cyber space as a weapon in case of Russia-Ukraine conflict.• In this case, Cyber space has become an experiment for various players to try and support a weaker nation against a more powerful opponent, through distortion of information and communication flows, which are considered essential to the success or failure of any war strategy.	<ul style="list-style-type: none">• Facebook's manipulation of personal data. It is evident that the cyber realm is no longer confined to events such as the Russia-Ukraine war and the battle is now in our own backyards, with several non-state actors engaging in hybrid warfare and distorting day-to-day practices, including examinations.• These pose legal, ethical and real dilemmas. Left unchecked.

Possible Solutions:

- **Defence of data**-The emphasis should be on prioritising the defence of data above everything else. Consequently, law enforcement agencies would need to play a vital role in providing effective defence against cyber-attacks.
- **Prioritise resilience**- While solving the technical side is 'one part of the solution, networks and data structures need at the same time to prioritise resilience through decentralised and dense networks, hybrid cloud structures, redundant applications and backup processes'.
- **Building trust in systems**- To prioritise building trust in systems whether it is an electrical grid, banks or the like, and creating backup plans including 'strategic decisions about what should be online or digital and what needs to stay analog or physical, and building capacity within networks to survive' even if one node is attacked.

ECONOMICS NOBEL HAS LESSONS FOR INDIA'S MACRO-ECONOMIC POLICY THOUGHT

CONTEXT:

The contribution made by this year's noble laureates in economics has a definitive role to play in the Indian economic landscape, particularly in liquidity creation.

◎ BACKGROUND:

- **Douglas Diamond and Philip Dybvig**: They have developed theoretical models to explore the banks' role and why they are/were vulnerable to crises. Their research was motivated by the experience of the banking sector during the great depression (1929-39).
- **Ben Bernanke**: He addressed the same questions pertaining to the great depression. His work explained why and how the depression became so deep. It also explains how the bank failures at the time **destroyed valuable banking relationships** and resulted in **credit supply contraction** leaving scars on the economy.

India's Economic landscape: (before the pandemic)

- **Twin balance sheet problem**: India has been trying to solve its Twin Balance Sheet problem—overleveraged companies and bad-loan-encumbered banks.
 - The share of large borrowers in the scheduled commercial bank loan portfolio was unusually high at 83.4% pre-covid in 2017.
- **Slowdown in overall private investment**: Investment witnessed an overall decline; neither the central government nor the private sector shows any appetite for it.
 - At present we can say that the **stressed banking sector has accentuated this problem**.

India's Economic landscape: (after the pandemic)

- **Recession Alarm Bells:** Predictions of deeper recession are on the horizon in many parts of the industrialized West indicating spillover effects on the emerging market including India.
- **Strong Dollar surge:** The exchange rates are unfavorably affecting the weaker currencies. Indian Rupee too may continue to remain in the shadows of the volatile global economic landscape.

The laureates' research generated three complementary insights:

- **Valuable "Maturity transformation" is inherently vulnerable (Diamond and Dybvig, 1983):** In order to create liquidity, the bank transforms long-term borrowing into short-term lending, thereby exposing its depositors to a vulnerability. Concern that other people may demand their deposits back, leading the bank to have insufficient funds, may lead all savers to run to the bank to withdraw their money.
 - ▶ Even fundamentally healthy banks may get into trouble if the **such bank runs become widespread.**
- **Delegated monitoring allows savers to get access to safe, high returns (Diamond, 1984):**
- Delegated monitor is a financial intermediary (bank) because it borrows from small investors (depositors), using unmonitored debt (deposits) to lend to borrowers (whose loans it monitors). It offers three advantages:
 - ▶ It pools funds from many savers and **diversifies across borrowers,**
 - ▶ **Banks reduce the aggregate monitoring costs** that would otherwise have been borne by borrowers.
 - ▶ This enables **households' savings to be channeled to productive investments** at a lower cost.
- Jointly, these (1) & (2) "**theoretical contributions**" explain how **financial intermediaries create liquidity in the economy.**
- **On the liability side,** Banks pool many savers (depositors) together, which also enables savers who end up needing liquidity to have their demand met by long-term savers who do not need liquidity at the same moment in time.
- **On the asset side,** banks pool many loans together and monitor them on behalf of savers, which makes it possible to finance risky and illiquid loans with much less risky and liquid deposits.
- **Financial intermediation is key for real activity (Bernanke, 1983):** Banks provide important screening and credit-monitoring services, and they develop crucial long-term relationships with borrowers.
 - ▶ During the great depression, it was seen, that when banks failed it took long for the banks to build new relationships, furthering the severe financial crunch.

Present concerns:

- Stressed nature of the banking and finance landscape
- Excessive (public-private) debt accumulation
- Rise of overleveraged companies
- Slowing down growth and production capacity.

GLOBAL HUNGER INDEX, 2022 SHOWS A 'SERIOUS' SITUATION FOR INDIA

CONTEXT:

In the recently released Global Hunger Index for year 2022, India ranked 107 out of 121 countries.

◎ ABOUT

- It is an **Annual report**, jointly published by Concern Worldwide and Welthungerhilfe.
- It was first produced in **2006**. It is published **every October**. The 2022 edition marks the **17th edition** of the GHI.

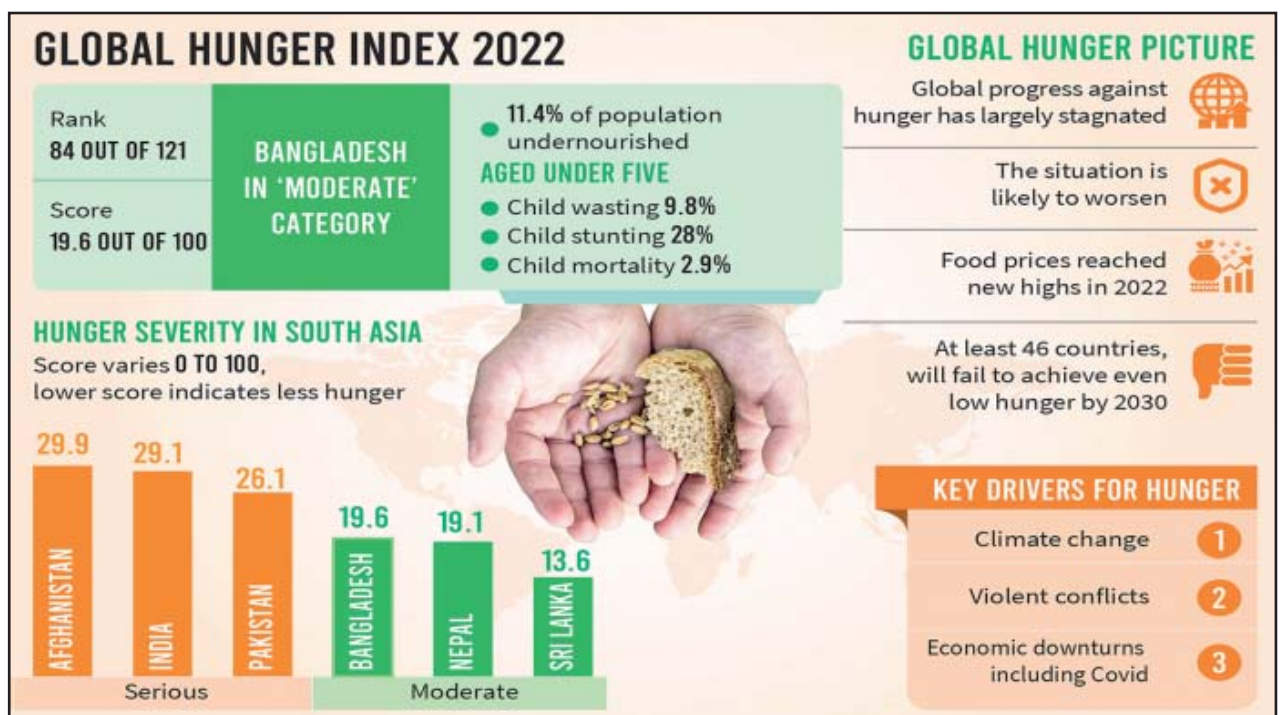
- **Aim:** To comprehensively measure and track hunger at the global, regional, and country levels.
- **Scoring:**

- **Calculation:** It is calculated on the basis of **four indicators**:
 - **Undernourishment:** Share of the population with insufficient caloric intake.
 - **Child Wasting:** Share of children under age five who have low weight for their height, reflecting acute under nutrition.
 - **Child Stunting:** Share of children under age five who have low height for their age, reflecting chronic under nutrition.
 - **Child Mortality:** The mortality rate of children under the age of five.

- Based on the values of the four indicators, the GHI determines hunger on a **100-point scale where 0** is the best possible score (no hunger) and 100 is the worst.
- Each country's GHI score is classified by severity, from low to extremely alarming.

Key Highlights of the Index:

- **India (107)** ranked below Sri Lanka (64), Nepal (81), Bangladesh (84), and Pakistan (99).
- **Afghanistan (109)** is the only country in South Asia that performs worse than India on the index.
- India's score of **29.1** places it in the '**serious**' category.
- China is among the countries collectively ranked between 1 and 17 having a score of less than five.
- The **2022 GHI score** for the world is considered "moderate", but 18.2 in 2022 is only a slight improvement from 19.1 in 2014.
- The reasons behind drop in position of several developing Countries remains to be the overlapping crises such as conflict, climate change, the economic fallout of the **COVID-19** pandemic as well as **the Ukraine war**, which has increased global food, fuel, and fertiliser prices.



India's performance on several Indicators:

- India's child wasting rate (low weight for height), at 19.3%, is worse than the levels recorded in 2014 (15.1%) and even 2000 (17.15%), and is the highest for any country in the world and drives up the region's average owing to India's large population.
- Prevalence of undernourishment, which is a measure of the proportion of the population facing chronic deficiency of dietary energy intake, has also risen in the country from 14.6% in 2018-2020 to 16.3% in 2019-2021.
- India has shown improvement in the other two indicators - child stunting has declined from 38.7% to 35.5% between 2014 and 2022 and child mortality has also dropped from 4.6% to 3.3% in the same comparative period.

Reasons for India's low score performance:

- Due disruptions in Global supply chains and Inflation
- Lack of Job Opportunities
- Poverty
- Population Explosion
- Lack of estimated targets for schemes including Children and Women.
- Other reasons being reduced soil fertility, fragmented lands or fluctuating market price of farm produce etc.

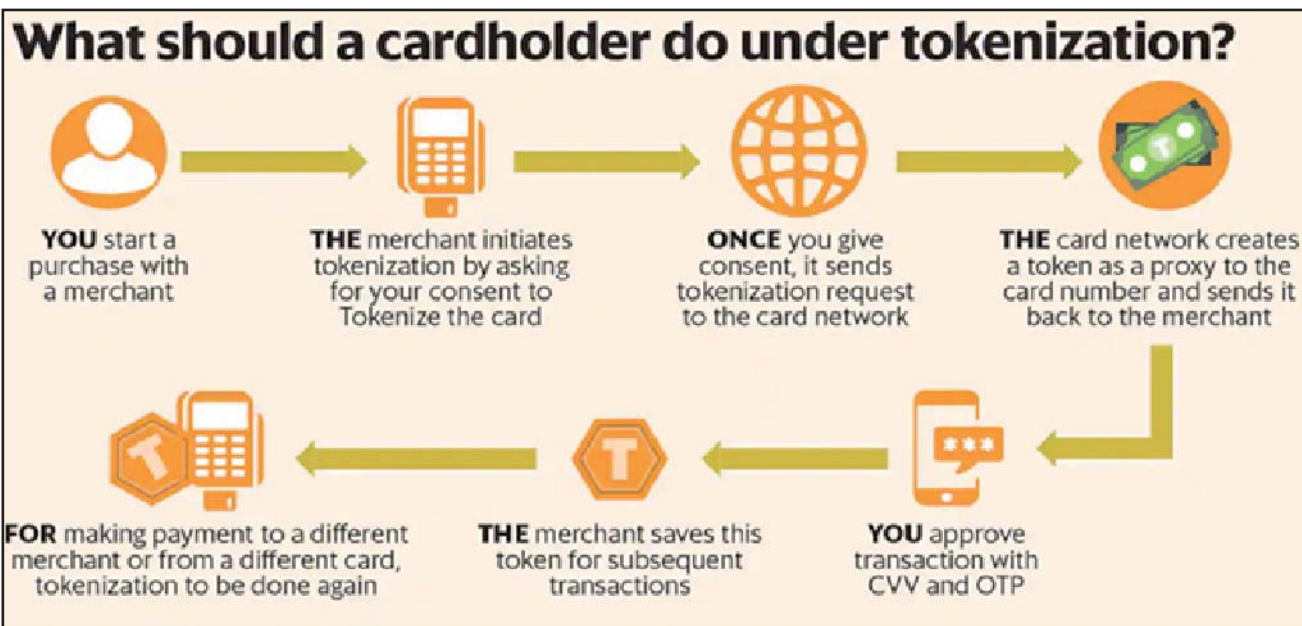
TOKENIZATION & PREVENTION OF ONLINE CARD FRAUD

CONTEXT:

The Reserve Bank of India (RBI) has mandated the tokenization of credit/debit cards for online merchants from October 1st, 2022.

What is tokenization?

- Tokenization refers to the **process of replacement of actual card details** with a unique alternate code known as the 'token', which shall be unique for a combination of card, token requestor, and identified device.
 - A tokenized card transaction is considered safer as the actual card details are not shared with the merchant during transaction processing.



- ▶ Customers who do not have the tokenization facility, will have to key in their name, 16-digit card number, expiry date, and CVV each time they order something online.
- ▶ As of now, about 19.5 crore tokens have been created. Opting for **Card-on-File Tokenization (CoFT) services**, (creating tokens) is voluntary for cardholders.
- **Reserve Bank of India (RBI)** has permitted authorized card payment networks to offer card tokenization services to consumers requesting it, in an effort to improve the safety and security of card transactions.

What is the new guidelines say on functioning Of Online Transactions?

- From 1st October 2022, merchants will not be allowed to store your card numbers, CVV, and expiry date for processing online transactions unless the card number is tokenized.
- Any existing details that were saved by merchants will be deleted.

What is Card-on-File (CoF)?

- A CoF transaction is a transaction where a cardholder has authorized a merchant to store the cardholder's Mastercard or Visa payment details.
- The cardholder then authorizes that same merchant to bill the cardholder's stored Mastercard or Visa account.
- E-commerce companies and airlines and supermarket chains normally store card details.

Why is the Tokenization of Cards Required?

- **Risk of misuse:** Many entities involved in an online card transaction chain store card data like card number and expiry date **Card-on-File (CoF)** for undertaking transactions in the future.
- While this practice does render convenience, the availability of card details with multiple entities increases the risk of card data being stolen or misused.
- Within India as well, social engineering techniques can be employed to perpetrate fraud using such data.

What are the benefits of tokenization?

- **Less sharing of Personal Data**
- **Ensure Safe transactions**
- **Tokenization reduces risk from data breaches:** Tokenization helps protect a business from the negative financial impacts of data theft. Even in the case of a breach, valuable personal data simply isn't there to steal.
- **Tokenization means less red tape for businesses:** Businesses that accept credit and debit cards need to be in compliance with the **Payment Card Industry Data Security Standard (PCI DSS)**. Tokenization makes achieving and maintaining compliance with industry regulations significantly easier.

What are the cases (instances/scenarios) for which tokenization have been allowed?

- Tokenization has been allowed through mobile phones and/or tablets for all use cases/channels (e.g., contactless card transactions, payments through QR codes, apps, etc.)

ORGANIC FERTILISER IN AGRICULTURE AND WAY TO SUSTAINABLE FUTURE

CONTEXT:

- With the fact that India has become one of the fastest growing economies of the World, it has invested in almost all sectors including the Organic fertilizers. India has a huge potential of Organic fertilisers and can edge in the field than other developing Countries.
- So, let us see what India's potential is and how it can help it to grow sustainable future in Agriculture.

◎ ABOUT

What are Organic Fertilizers?

- **Organic fertilizers** are fertilizers that are naturally produced. Fertilizers are materials that can be added to soil or plants, in order to provide nutrients and sustain growth.
- Typical organic fertilizers include all animal waste including meat processing waste, manure, slurry, and guano; plus plant based fertilizers such as compost; and bio-solids.
- Inorganic "organic fertilizers" include minerals and ash.
 - **For Example:** The main organic fertilizers are, peat, animal wastes, plant wastes from agriculture, and treated sewage sludge.

Types of Organic Fertilizers:

- Organic fertiliser can be categorised into **two segments**, according to government rules:
 - **Bio-fertiliser:** Bio-fertilisers are composed of living microorganisms attached to solid or liquid carriers and are useful for cultivable land, as these micro-organisms help in increasing the productivity of soil and / or crops.
 - **Organic manure:** It refers to partially decomposed organic matter like digestate from biogas plant, compost and vermin compost, which provides nutrients to the soil / crops and improves yield.

India's potential:

- India produces more than **150,000 tonnes** of municipal solid waste (MSW), based on estimated MSW generation data from the National Solid Waste Association of India and the Central Pollution Control Board.
- Considering collection efficiency of **80 per cent** and organic part of MSW to be **50 per cent**, total organic waste generated per day in India comes to around **65,000 tonnes per day**.
- Even if half of this is diverted to the **biogas industry**, the government can leverage this by reduction in import of **fossils and fertilisers**.
- **Biogas / gobar gas plants** can produce biogas and also organic fertilisers.
- There is also great value in the organic fertiliser also known as digestate, which is the biogas plant's effluent.
- Biogas can be utilised for heating, electricity and even vehicular purposes (after upgrading), whereas digestate can help realise the vision to have a **second green revolution**.

Benefits of Organic fertilizers	Challenges associated
<ul style="list-style-type: none"> • Boost both nutrient efficiency and organic matter content in the soil; • nurture the soil with organic matter that reduces dependency on chemical inputs; • restore and maintain soil fertility to nurture plant growth; • enhance the biological activity and biodiversity of soils; • enhance the quality attributes of produce as well as yield; • improve the efficiency of nutrient use to produce more robust crops; • facilitate the slow release of nutrients in response to the dynamic needs of plants; • boost the efficiency of water use to render crops more resilient and drought-resistant; 	<ul style="list-style-type: none"> • Organic food is more expensive because farmers do not get as much out of their land as conventional farmers do. • Production costs are higher because farmers need more workers. • Marketing and distribution is not efficient because organic fertilizers can be produced in smaller amounts as required. • Organic farmers does not have sufficient knowledge and skills about localized soil systems, meteorology, ecology, and other factors that influence crop growth. Without the proper knowledge, an individual organic farmer will be unable to protect his crop in critical stages that may arise while farming processes. • The crops are easily susceptible to illness that may slow down production.

- | | |
|---|---|
| <ul style="list-style-type: none"> • Reduce the impact of farming and safeguard ecosystems by minimizing leaching. • Enhance crop resistance to erosion by improving the soil's organic matter content. • Improve the efficiency of resource use by incorporating natural raw materials. | <ul style="list-style-type: none"> • Organic farms have to go through tough certification processes. |
|---|---|

How do organic-based fertilizers contribute to sustainability?

- **Smart growth** – for an economy based on research, knowledge and innovation.
- **Sustainable growth** – for a resource-efficient, greener and more competitive economy.
- **Inclusive growth** – for a high-employment economy with social and territorial cohesion.
- The organic-based fertilizers industry generates local employment opportunities and regional economic development across both rural and urban areas, nurturing more vibrant manufacturing and farming communities.

Few Government Initiatives promoting Organic Fertilizer:

- **Paramparagat Krishi Vikas Yojana (PKVY):** Cluster formation, training, certification and marketing are supported under the scheme to a farmer towards organic inputs.
- **Participatory Guarantee System (PGS) certification** system.

BALANCING CLIMATE CHANGE AND GLOBAL NUTRITION

CONTEXT:

It is high time for India to develop technologies that not only fulfill food and nutritional needs but also addresses climate change.

How climate change impacts nutrition?

- Climate change, agriculture and nutrition are intrinsically linked. Climate change impacts under-nutrition via following major pathways:
 - Degraded quality of foods consumed
 - Affected household food security
 - Food availability, costs, and overall calorie consumption
 - Affected agricultural yields, nutritional quality of crops
 - Environmental health and access to health services

How has the situation changed?

- The global population in 1945 was a little less than 2.5 billion and was increasing at an annual rate of about 1.9 percent per annum.
- Today, there are almost 8 billion people on this planet, and there is ample food to feed them.
- Access to food at affordable prices, however, remains a challenge for a substantial segment of humanity.

Role of Science and Technology:

- The world is able to produce so much food that the entire global population can be fed.
- This speaks of the success of science and innovations in the agri-food space.
- Countries that are guided by scientific knowledge and the spirit of innovation, instead of ideologies and dogmas, have produced ample food, even in deserts. For example, Israel.

Challenge/Problem	Examples of science, technology, and innovation
Biotic stresses	<ul style="list-style-type: none"> • Disease- or pest-resistant crops • Pest-resistant eggplant • Rust-resistant wheat varieties • Pesticides, Herbicides • Tilling machines • Spatial repellent for on-farm pests • Improved agronomic practices (for example, push-pull mechanisms)
Abiotic stresses	<ul style="list-style-type: none"> • Salt-tolerant crops (for example, quinoa, potato) • Climate-resistant crops
Improving crop productivity	<ul style="list-style-type: none"> • Conventional breeding • Tissue culture and micropropagation • Marker-assisted breeding • Advanced genetic engineering • Low-cost diagnostic toolkit for extension workers
Improving livestock agriculture	<ul style="list-style-type: none"> • High-nutrient, low-cost animal fodder • Liquid nitrogen and low-cost alternatives for animal semen preservation • Low-cost diagnostic toolkits for livestock veterinarians • Tissue engineering for laboratory-grown animal products • Low-cost veterinary pharmaceuticals
Lack of water availability	<ul style="list-style-type: none"> • Water storage technologies (subsurface water technologies, aquifers, ponds, tanks, low-cost plastic water tanks, natural wetlands, reservoirs) • Canal irrigation • Micro-irrigation technologies, drip irrigation, bubbler irrigation, microsprinkler irrigation • Water lifting (hand-powered mechanical pumps, treadle pumps, solarpower irrigation pumps, hydrogen-powered pumps, electric and fossil fuel pumps) • Planting technology for increased water efficiency • Rainwater harvesting mechanisms • Conservation agriculture, Portable sensors for groundwater detection
Soil	<ul style="list-style-type: none"> • Synthetic and organic fertilizers • Zero or conservation tillage • Soil microorganisms • Natural nitrogen fixation

Food security and Indian past:

- **Two successive droughts** in the mid-1960s brought the country literally to its knees for meeting the basic food requirement of its people.
- India was forced to rely on **PL 480 food aid from the USA** and had to live from “**ship to mouth**”.
- India soon realized such high dependence on others for food could lead to political compromises.

High-yielding varieties (HYV) of wheat:

- High-yielding varieties (HYV) of wheat by Normal Borlaug and his team in CIMMYT, and Henry Beachell and Gurdev Khush in rice at IRRI.
- Normal Borlaug received the Nobel Prize for peace in 1970.
- Borlaug envisioned setting up the World Food Prize, somewhat equivalent to the Noble Prize for Agriculture.

World Food Prize:

- The World Food Prize is given every year on October 16 in a special ceremony in Des Moines, Iowa.
- Indians including **M S Swaminathan, Verghese Kurien, Gurdev Khush, and Rattan Lal** have been recipients of the prize.

The path towards self-reliant in food:

- There seems to be a lack of sync between policies and technologies.
- India needs to double or even triple its expenditure on agri-research.
- This needs to go up preferably between 1.5 to 2 percent of the agri-GDP.
- Climate smart food systems that engage producer and consumer decision making, which
 - ▶ improves production of food
 - ▶ minimizes losses
 - ▶ reduces green-house gas emissions from agriculture
 - ▶ implements adaptation strategies for the most vulnerable

GREEN INVESTMENTS AND SUSTAINABILITY

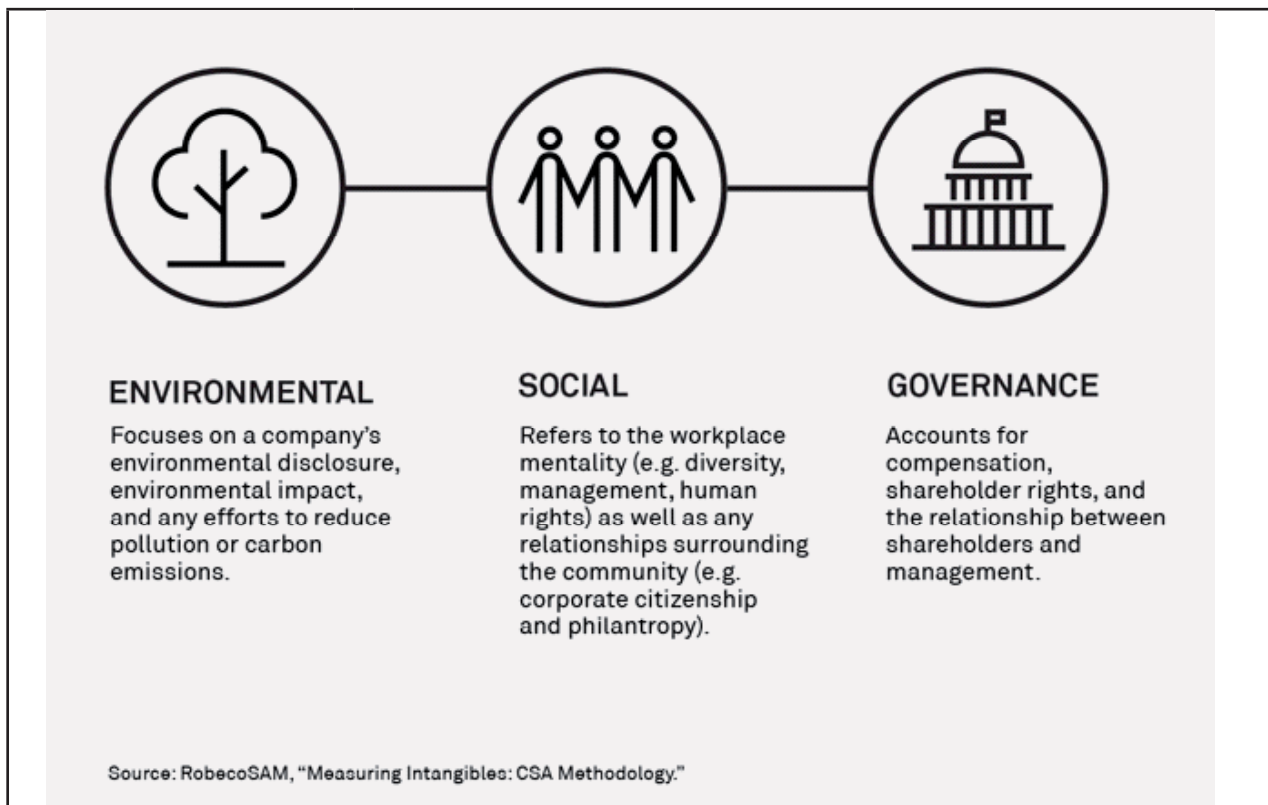
CONTEXT:

As the world aims to bring the Greenhouse gas emissions to sustainable levels by 2050 to prevent irreversible damage to the environment, the Companies have to work for Environment, Social and Governance (ESG) factors for making its impacts more sustainable in all aspects.

◎ ABOUT**What are ESG Goals?**

- **Environmental, Social, and Governance (ESG) goals** are a set of standards for a company's operations that force companies to follow better governance, ethical practices, environment-friendly measures and social responsibility. These includes:

Environmental	Social	Governance
Environmental is all about an enterprise focus and action leadership around energy usage, waste management, and natural resources conservation.	Social deals with an enterprise relationship and reputation with its employees, customers, stakeholders, institutions and the larger community.	Governance is all about how an enterprise manages with the proper management structure, executive compensation and ensuring stakeholder rights, especially employees, shareholders and customers.



- It focuses on **non-financial factors** as a metric for guiding investment decisions wherein increased financial returns is no longer the sole objective of investors.
- Ever since the introduction of the **United Nations Principles for Responsible Investing** (UNPRI) in 2006, the ESG framework has been recognised as an inextricable link of modern day businesses.

Europe has been a pioneer in ESG norms with some countries initiating ESG investment mandates.

India and ESG norms:

- ESG as a concept is not new to India.
- SEBI requires top **1,000 listed companies** to issue Business Responsibility and Sustainability Report that includes ESG concepts in its disclosures.
- India also has a **green bond market**, proceeds of which are used to fund renewable energy projects.

What Initiatives have been taken to Ensure ESG Compliance?

- National Voluntary Guidelines:** One of the initial milestones towards identifying ESG disclosure requirements for companies was the release of **the National Voluntary Guidelines on Social, Environmental and Economic Responsibilities of Business (NVGs)** in 2011 by the **Ministry of Corporate Affairs (MCA)**.
- Business Responsibility Reports:** In 2012, the SEBI formulated the Business Responsibility Reports (BRR) which mandated top 100 listed entities (which was extended to top 500 listed entities in 2015) by market capitalization to file BRR as part of their annual report.
- Business Responsibility and Sustainability Report:** In 2021, SEBI replaced the existing BRR reporting requirement with a more comprehensive integrated mechanism, the Business Responsibility and Sustainability Report (BRSR).
 - It will be mandatorily applicable to the top 1,000 listed entities (by market capitalization) from FY 2022-23 onwards.
 - The BRSR seeks disclosures from listed entities on their performance against the nine principles of the '**National Guidelines on Responsible Business Conduct**' (NGBRCs).

Persistent Challenges:

- **Lack of standardisation** of reporting requirements across borders pose difficulties in harmonising ESG principles, frameworks and considerations.
- **Lack of transparency**, consistency, and materiality of ESG standards pose roadblocks in the seamless implementation of ESG reporting framework ahead.
- **Requirement of high capital costs** and/or lack of expertise in implementing ESG measures.

LIVING PLANET REPORT 2022

CONTEXT:

Recently, the World Wide Fund for Nature (WWF) released the Living Planet Report for the year 2022.

The Living Planet Report:

- Living Planet Report is **WWF's** flagship publication. It is released every **two years**.
- **Objective:** It is a comprehensive study of trends in **global biodiversity** and health of the planet. It tracks changes in the relative abundance of wild species populations across the globe.
- **Changes from last Report:**
 - The Living Planet Index (LPI) is continually changing with **838 new species** and 11,011 new populations being added to the dataset since the **2020 LPR** was released.

The **Living Planet Index (LPI)** is a measure of the state of the world's biological diversity based on population trends of vertebrate species from terrestrial, freshwater and marine habitats.

The LPI was adopted by the **Convention of Biological Diversity (CBD)** as an indicator of progress towards its 2011-2020 targets.

- There has been a significant increase in the **number of fish species (481)** that have been added to the Living Planet Report.

Key highlights: (Addressing Environment & Biodiversity)

- **Decline in Population:**
 - There has been a **69 per cent decline** in the wildlife populations of mammals, birds, amphibians, reptiles and fish, across the globe in the last 50 years.
 - The **freshwater populations have declined the most**, with an average 83% decline between 1970 and 2018.
 - The IUCN Red List shows **cycads, an ancient group of seed plants, are the most threatened species**, while corals are declining the fastest, followed by amphibians.
- **Region wise assessment:**
 - The highest decline (94 per cent) was in Latin **America and the Caribbean region**.
 - **Africa** recorded a 66 per cent fall in its wildlife populations from 1970-2018.
 - **Asia Pacific's** monitored populations fell by 55%.
 - **Southeast Asia** is the region where species are most likely to face threats at a significant level.
 - **The Polar Regions and the east coast of Australia and South Africa** showed the highest impact probabilities for climate change, driven in particular by impact on birds.
- **Mangroves:**
 - Mangroves continue to be lost to aquaculture, agriculture and coastal development at a rate of **0.13 per cent per year**.

- ▶ Mangrove-loss represents **loss of habitat for biodiversity** and the loss of ecosystem services for coastal communities.
- ▶ Around 137 square kilometres of the **Sundarbans mangrove forest** in **India and Bangladesh** has been eroded since 1985, reducing land and ecosystem services for many of the 10 million people who live there.
- **Corals:**
 - ▶ About **50% of warm water corals have already been lost** and a warming of 1.5 degrees Celsius will lead to a loss of **70-90% of warm water corals**.
 - ▶ **The Bramble Cay melomys**, a small Australian rodent, was declared extinct after sea-level rise.
- **Sharks:**
 - ▶ The global abundance of **18 of 31 oceanic sharks has declined by 71% over the last 50 years** and the report said that by 2020 three-quarters of sharks and rays were threatened with extinction.
- **Others:**
 - ▶ Only 37% of **rivers** longer than 1,000km remain free-flowing over their entire length.
 - ▶ 41% **land-use change** is the biggest current threat to nature.
 - ▶ Report says action is needed to **reverse biodiversity loss by 2030 and keep global warming to 1.5°C**.
 - ▶ By moving to sustainable, healthy, and culturally appropriate diets we can **reduce agricultural land** use by 41% and wildlife loss by up to 46%.

Report highlights for India:

- **Vulnerability of Biospheres:** The **Himalayan region** and the **Western Ghats** are some of the most vulnerable regions in the country in terms of biodiversity loss, and where increased biodiversity loss is expected in future if temperatures are to increase.
- **Indicators of Ecosystem health are in Danger:** India has seen a decline in population of the likes of honeybees and 17 species of freshwater turtles in this period.

Anthropogenic causes:

- Habitat loss and barriers to migration routes
- Land-use change is still the biggest current threat to nature
- Human-induced climate change and biodiversity losses
- **Agriculture** is the most prevalent threat to amphibians

Threats:

- WWF identified **six key threats** to biodiversity: agriculture, hunting, logging, pollution, invasive species and climate change to highlight 'threat hotspots' for terrestrial vertebrates.
- **Climate change** in India will impact key areas, such as water resources, agriculture, natural ecosystems, health and the food chain.

Section: B

(SPECIALS)

CURRENT AFFAIRS

MISSION KARMYOGI: AN ATTEMPT TO CHANGE THE FACE OF CIVIL SERVICES

CONTEXT:

With the need for an efficient citizen-centric approach for people at ground level, has made the Prime Minister to launch the Mission Karmayogi on Independence Day, 2021.

- ▢ The scheme has aimed to focus the working of civil services towards their duties.

◎ ABOUT

The Mission Karmayogi:

- **Mission Karmayogi - National Programme for Civil Services Capacity Building (NPCSCB)** – is meant to reform **Indian bureaucracy** and prepare civil servants for the future.

Manager of the Mission:

- A Public Human Resource Council under the chairmanship of Prime Minister will manage the mission. The other members of this council are:
 - Union Ministers
 - Chief Ministers
 - Eminent public HR practitioners
 - Thinkers
 - Public service functionaries
 - Global thought leaders
- The programme aims “comprehensive reform of the capacity building apparatus at individual institutional and process levels for efficient public service delivery”.

of Human Resources and Development (MHRD) which will deliver capacity building programmes by drawing content from global best practices rooted in Indian national ethos.

- It will enable a comprehensive reform of the capacity building apparatus at the individual, institutional and process levels.

- **Shift from Rules to Roles:** The programme will support a transition from “rules-based to roles-based” Human Resource Management (HRM) so that work allocations can be done by matching an official’s competencies to the requirements of the post.
- **Integrated Initiative:** Eventually, service matters such as confirmation after the probation period, deployment, work assignments and notification of vacancies will all be integrated into the proposed framework.
- **Monitoring and Evaluation Framework:** An appropriate monitoring and evaluation framework will also be put in place for the performance evaluation of all users of the iGOT-Karmayogi platform so as to generate a dashboard view of Key Performance Indicators.

Importance of the Civil Service to Governance

- Service presence throughout the country and its strong binding character
- The administrative and managerial capacity of the services
- Effective policy-making and regulation
- Effective coordination between institutions of governance
- Leadership at different levels of administration.
- Service delivery at the cutting-edge level
- Provide ‘continuity and change’ to the administration.

◎ OBJECTIVE:

- Better delivery of government services
- Reduce the gap between the citizens and the government
- Better ease of living and greater ease of doing business

Features of the Mission Karmayogi:

- **Tech-Aided:** The capacity building will be delivered through the **iGOT Karmayogi** digital platform, with content drawn from global best practices.

What is iGOT-Karmayogi?

- It is an **Integrated Government Online Training digital platform** under the Ministry

There are nearly **18 million civil servants** employed across India, with approximately two-thirds at the state government and local authority levels. (**World Bank Update**)

Ailments Afflicting Indian Civil Services:

- **Lack of professionalism** and poor capacity building
- **Inefficient incentive systems** that do not appreciate upright and outstanding civil servants but reward the corrupt and the incompetent
- **Outmoded rules** and procedures that restrict the civil servant from performing effectively
- **Systemic inconsistencies** in promotion and empanelment
- **Lack of adequate transparency and accountability procedures** - there is also no safety for whistle-blowers
- **Arbitrary and whimsical transfers** – insecurity in tenures impedes institutionalization
- **Political interference** and administrative acquiescence
- **A gradual erosion in values and ethics**

Section: C

(PRELIMS)

CURRENT AFFAIRS

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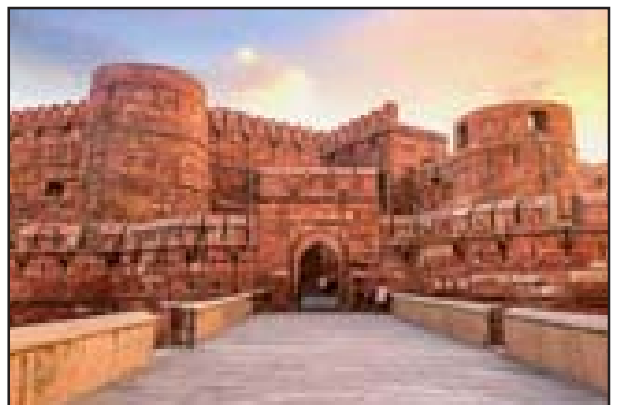
HAMPI, KHAJURAHO AND OTHER UNESCO SITES ON LIST FOR G20 CULTURE TRACK

- ◎ **CONTEXT:** As a part of India's G20 Presidency between December 2022 and November 2023, the Government is planning to host five key meetings focusing on the cultural influence at Khajuraho, Bhubaneswar, Hampi and Agra for their ancient linkages and worldwide recognitions.

The FIVE sites listed: (Showcasing Cultural Agenda)

■ The Agra Fort, UP:

- It is an important **16th-century Mughal monument** known as the **Red Fort of Agra**.
- This powerful fortress of red sandstone encompasses, within its 2.5-km-long enclosure walls, the imperial city of the Mughal rulers.
- It comprises many fairy-tale palaces, such as the Jahangir Palace and the Khas Mahal, built by Shah Jahan; audience halls, such as the Diwan-i-Khas; and two very beautiful mosques.
- The Agra Fort, also known as the "Lal -Qila", "Fort Rouge" or "Qila-i-Akbari", is the highlight of the city of Agra, then capital of the **Mughal Sultanate**.



■ The Taj Mahal, Uttar Pradesh:

- It is an immense mausoleum of white marble, built in Agra between **1631 and 1648** by order of the **Mughal emperor Shah Jahan** in memory of his favourite wife, the Taj Mahal is the jewel of Muslim art in India and one of the universally admired masterpieces of the **world's heritage**.



■ The Konark Sun Temple, Odisha:

- Konark Sun Temple is a **13th-century CE (year 1250) Sun temple** at Konark about 35 kilometres (22 mi) northeast from Puri city on the coastline in Puri district, Odisha, India.
- The temple is attributed to king Narasimhadeva I of the Eastern Ganga dynasty about 1250 CE.
- Dedicated to the **Hindu Sun God Surya**, what remains of the temple complex has the appearance of a 100-foot (30 m) high chariot with immense wheels and horses, all carved from stone.
- The structures and elements that have survived are famed for their intricate artwork, iconography, and themes, including erotic kama and mithuna scenes.
- Also called the **Surya Devalaya**, it is a classic illustration of the Odisha style of Architecture or **Kalinga architecture**.



■ The Khajuraho Temple, Madhya Pradesh:

- The Khajuraho Group of Monuments are a group of Hindu and Jain temples in Chhatarpur district, Madhya Pradesh, India, about 175 kilometres southeast of Jhansi.
- They are a UNESCO World Heritage Site. The temples are famous for their nagara-style architectural symbolism and a few erotic sculptures.
- Most Khajuraho temples were built between 885 AD and 1000 AD by the **Chandela dynasty**. Historical records note that the Khajuraho temple site had 85 temples by the 12th century, spread over **20 square kilometers**.
- Of these, only about **25 temples** have survived, spread over **six square kilometers**.
- Of the surviving temples, the **Kandariya Mahadeva Temple** is decorated with a profusion of sculptures with intricate details, symbolism and expressiveness of ancient Indian art.



■ The Hampi, Karnataka:

- Hampi was the capital of the **Vijayanagara Empire** in the 14th century. It was a fortified city.
- Chronicles left by Persian and European travellers, particularly the Portuguese, say that Hampi was a prosperous, wealthy and grand city near the **Tungabhadra River**, with numerous temples, farms and trading markets.
- By 1500 CE, **Hampi-Vijayanagara** was the **world's second-largest medieval-era city** after Beijing and probably India's richest at that time, attracting traders from Persia and Portugal.



G20 Presidency: India's Role

- The **G20** is an intergovernmental forum comprising 19 countries — Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, South Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the UK, the US — and the European Union.
- During the G20 Presidency, India is going to invite Bangladesh, Egypt, Mauritius, Netherlands, Nigeria, Oman, Singapore, Spain and UAE as guest countries.
- Setting the **cultural agenda** for the meetings to be organised during the presidency of India, it provides a fantastic opportunity to shape the global agenda on culture across multiple work streams and engagement areas.
- **These include:**
 - Protection and restitution of cultural property;
 - Advancement of traditional cultural practices for sustainable living;
 - Promotion of cultural and creative industries for livelihood generation; and
 - Preservation and dissemination of culture by leveraging technology.

SOLAR ALLIANCE APPROVES FUNDING MECHANISM

- ◎ **CONTEXT:** In the direction to bolster investments in solar power projects, the International Solar Alliance (ISA) has approved 'Solar Facility', a payment guarantee mechanism.

The mission

About International Solar Alliance (ISA):

- The International Solar Alliance (ISA) is an **action-oriented, member-driven, collaborative platform** for the increased deployment of solar energy technologies.
 - Its basic motive is to **facilitate energy access, ensure energy security, and drive energy transition** in its member countries.
- ISA's mission is to unlock **US\$ 1 trillion (₹80 lakh crore) of investments** in solar power by 2030 while reducing the cost of the technology and its financing.
 - It is going to stimulate investments into solar projects through **two financial components**:
 - **Solar Payment Guarantee Fund:**
 - The payment guarantee fund will only provide a partial guarantee.
 - The guarantee fund would enable investments in geographies that do not receive investments.
 - **Solar Insurance Fund:**
 - It will reduce the burden of insurance premiums for solar developers in the pre-revenue phase of the project.
 - It will offset the cost of insurance for a specified period.

RUSSIA JOINS THE RACE TO SUPPLY LIGHT BATTLE TANKS TO THE INDIAN ARMY

- ◎ **CONTEXT:** Russia will field its Sprut-SDM1 light amphibious tank for the Indian Army's upcoming tender for light tanks.

◎ **DETAILS:**

- The project has received in-principle approval and is planned to be procured under the '**Make-I**' acquisition category of the **Defense Acquisition Procedure (DAP)-2020**.
 - '**Make-I**' refers to government-funded projects while '**Make-II**' covers industry-funded programmes.
 - **Make-I** was involved in the development of big-ticket platforms such as light tanks and communication equipment with Indian security protocols.
- This is in line with the 'Make in India' initiative.
- The **Acceptance of Necessity (AoN)** from the Defence Acquisition Council is expected shortly.



Defence Acquisition Procedure (DAP) 2020:

- It enables the **notification of a List of Weapons or Platforms that will be banned** for import.
- It focuses **on Foreign Direct Investment (FDI) in defence manufacturing** and indigenization of the manufacturing prices.
- It also introduces several new ideas such as **the need to incorporate artificial intelligence in platforms and systems, the use of indigenous software in defence equipment** and **'innovation' by Start-ups and MSMEs (Micro, Small and Medium Enterprises)** as new categories of defence acquisition.

About Sprut-SDM1 Light Amphibious Tank:

- **Project Type:** Light amphibious tank
- **Manufacturer:** Tractor Plants Concern
- **Crew:** Three
- **Length:** 7.08m
- **Maximum Amphibious Speed:** 7km/h
- **Maximum Road Speed:** 70km/h
- **Maximum Range:** 500km

Armament and protection feature of Sprut-SDM1:

- The primary armament of the tank is a 125mm gun fitted to the remote-controlled weapon station.
- The secondary armament of the tank consists of a 7.62mm machine gun and a 7.62mm coaxial machine gun.
- **Guided missile weapon system:** To defeat explosive reactive armour (ERA)-equipped targets and armoured fighting vehicles at ranges up to 5km.
- Protection of the onboard crew from nuclear, biological and chemical (NBC) threats.
- **Fire control system:** A next-generation digital fire control system (FCS) is integrated in the amphibious vehicle.
- **Hydro-pneumatic type suspension system:** It offers improved driving comfort over all types of terrain.

Other Capabilities:

- Cross water obstacles and fire its gun while afloat
- Disembark from a ship

Chinese deployments in eastern Ladakh (LAC):

- Third-generation modern light tank ZTQ 15 (Type 15)
- The latest ZTL-11 wheeled Armoured Personnel Carriers
- CSK series of assault vehicles

- Operate in high mountains in conditions of thin air, at very high and low temperatures.

Need for light tank:

- After a standoff with China in eastern Ladakh, the Indian Army is prioritising the procurement of a light tank, named **'Zorawar'**, for deployment in the mountains.
- The army had issued a **Request For Information (RFI)** for the procurement of 350 light tanks weighing less than 25 tonnes in a phased manner.

THE INTERPOL GENERAL ASSEMBLY MEETING HELD IN DELHI

◎ **CONTEXT:** The General Assembly of the International Criminal Police Organisation (Interpol) recently held in Delhi.

- This is the second time since 1997 the 195 member-strong body is holding such a large conference in India.

◎ **ABOUT**

- Interpol was set up in 1923.
- It is a secure **information-sharing platform** that facilitates **criminal investigation of police forces** across the globe through collection and dissemination of information received from various police forces.
- **Aim:** to promote the widest-possible mutual assistance between criminal police forces.
- **Functions:**
 - It keeps track of the movements of criminals and those under the police radar in various regions and tips off police forces which had either sought the Interpol's assistance or which in its opinion will benefit from the particulars available with it.

The **CBI** assumes the role of highest Investigation body in India with one of its senior officers heading its exclusive **Inter-wing (the National Central Bureaus)** for collation of information and liaison with the world body.

PRESIDENT DROUPADI MURMU FLAGS OFF TRIPURA-MANIPUR TRAIN

◎ **CONTEXT:** Recently, President Droupadi Murmu has flagged off two passenger trains, one of them connecting Tripura and Manipur for the first time.

◎ **ABOUT**

- The **Jan Shatabdi Express** will operate between Tripura capital **Agartala** and Khongsang in Manipur.
- The other train is a special express linking Agartala and Kolkata via Guwahati.

Upcoming Projects:

Guwahati-Lumding-Guwahati Express: The first train between Nagaland and Meghalaya.

- The **Northeast Frontier Railway (NFR)** has undertaken an ambitious project to connect **all eight northeastern States'** capitals or take the railway line to a strategic place nearest these towns.

Key features of the Project:

- The Agartala-Khongsang section is on the **110 km Jiribam-Imphal** new line project.
- The project is a part of the aspiring initiative to **connect northeast** from mainland India.



INDIAN RAILWAYS ANNOUNCES THE CLOSURE OF COFMOW

◎ **CONTEXT:** The Ministry of Railways announced the closure of the four-decade-old Central Organisation for Modernization of Workshops (COFMOW).

◎ **DETAILS:**

- On the recommendations of the Principal Economic Advisor, Ministry of Finance, on the rationalization of government bodies, the Railway Board confirmed the winding up of (COFMOW).

Central Organisation for Modernisation of Workshops (COFMOW):

- COFMOW was established under the Ministry of Railways by the Govt. of India for modernizing Indian Railway workshops.
- The modernization project was funded through World Bank credits.
- Since its establishment in 1979 COFMOW has assisted in modernizing Indian Railways Production Units and maintenance workshops.

- It emerged as a leading specialized organization in the fields of manufacturing and maintenance technologies.

Impact:

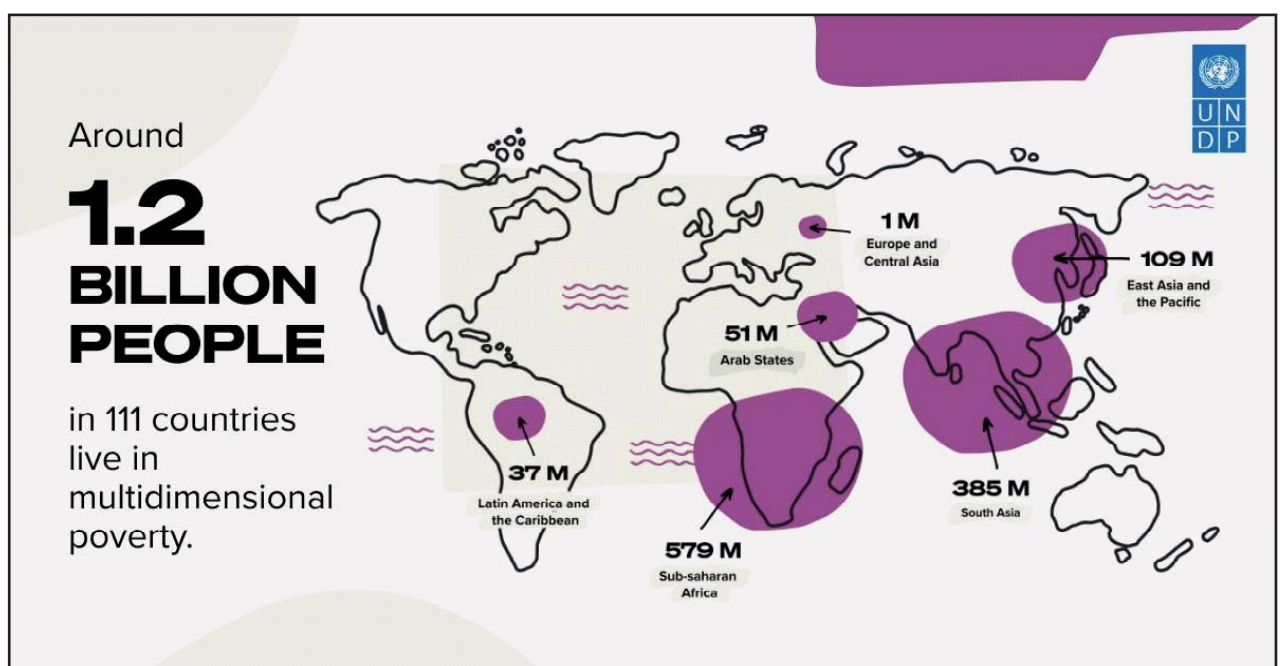
- COFMOW was barred from floating or opening of tenders with immediate effect.
- All sanctioned works against which tenders have not been finalized yet will be transferred to the respective Zonal Railways.
- All non-gazette posts would be surrendered and the staff released/repatriated/re-deployed elsewhere.

GLOBAL MULTIDIMENSIONAL POVERTY INDEX RELEASED

- ◎ **CONTEXT:** The recently released Global Multidimensional Poverty Index (MPI) indicates that 41.5 crore people exited poverty in India during the 15-year period between 2005-06 and 2019-21.

Key Highlights: (India-specific Data)

- It shows that the **incidence of poverty fell** from 55.1% in 2005-06 to 16.4% in 2019-21 in the country.
- The **deprivations in all 10 MPI indicators saw significant reductions** as a result of which the MPI value and incidence of poverty more than halved.
- About 41.5 crore people exited poverty in India** during the 15-year period between 2005-06 and 2019-21, out of which two-thirds exited in the first 10 years, and one-third in the next five years.
- Improvement in MPI for India has significantly contributed to the **decline in poverty in South Asia**.
- It is for the **first time that it is not the South Asian region** with the highest number of poor people, at 38.5 crores, compared with 57.9 crores in **Sub-Saharan Africa**.
- The **report doesn't fully assess the effects of the COVID-19 pandemic on poverty in India** as 71% of the **data from the National Family Health Survey-5 (2019-2021)** relied upon for MPI **were collected before the pandemic**.
- Bihar is the poorest State in 2015-2016, seeing the fastest reduction in MPI value** in absolute terms. The incidence of poverty there fell from 77.4% in 2005-2006 to 34.7% in 2019-2021.



India's present scenario:

- India has by far the largest number of poor people worldwide at 22.8 crores, followed by Nigeria at 9.6 crores.
- Two-thirds of these people live in a household in which at least one person is deprived of nutrition.
- There were also 9.7 crore poor children in India in 2019-2021.
- About 4.2% of the population in the country still lives in severe poverty.
- Rural areas account for nearly 90% of poor people.

The Global Multidimensional Poverty Index:

- **Definition:** The global Multidimensional Poverty Index (MPI) is an international measure of acute multidimensional poverty covering over 100 developing countries.
 - It complements traditional monetary poverty measures by capturing the acute deprivations in health, education, and living standards that a person faces simultaneously.
- **Developed by:** The global MPI was developed by Oxford Poverty and Human Development Initiative (OPHI) with the UN Development Programme (UNDP) for inclusion in UNDP's flagship Human Development Report in 2010.
 - It has been published annually by OPHI and in the HDRs ever since.
- The global MPI constructs a deprivation profile of each household and person through 10 indicators spanning health, education, and standard of living and includes both incidences as well as the intensity of poverty.
- All indicators are equally weighted within each dimension.
- The global MPI identifies people as multi-dimensionally poor if their deprivation score is **1/3** or higher.

STRENGTHENING DOLLAR AND IMPACT ON FOREX RESERVES

◎ **CONTEXT:** Recently, the Union Finance Minister has said that the decline in India's foreign exchange reserves is largely due to the valuation changes arising from an appreciating U.S. dollar.

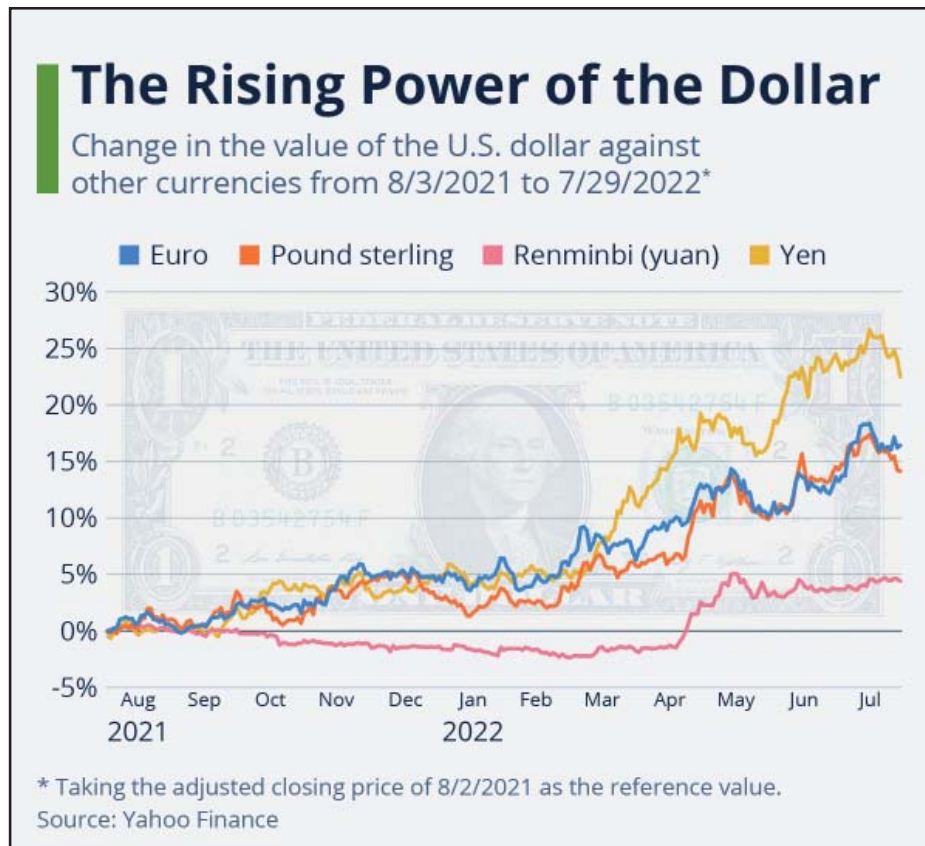
◎ **BACKGROUND**

- The GDP growth for Q1 of the current financial year 2022-23 at 13.5% is the **highest among the large economies**.
- The **Government expenditure is now tilted towards capital** rather than revenue, strengthening the foundations for medium-term growth.
- Touching 13.5% GDP growth in Q1 enabled India to cross the pre-pandemic level by 3.8%.
- **Bolstering consumer confidence** and revival of contact-intensive activities.
- Gross fixed capital formation (GFCF) growth shot up to 20% in Q1.
- **Both exports and imports are growing at double digits** but import growth is more robust than that of exports, reflecting the revival of the domestic economy.

How Dollar affects other Currencies?

- The U.S. dollar has been a bedrock of the global economy and a reserve currency for international trade and finance.
- Like any other fiat currency, the dollar's relative value depends on the economic activity and outlook of the United States.

- In addition to fundamentals and technical factors, market psychology and geopolitical risk also influence the dollar's value on the world market.



India and Strengthening Dollar:

- **India's foreign exchange reserves** at \$537.5 billion as of September 23, 2022, are in a favorable **position** with most peer economies.
- **Two-thirds of the decline in reserves is due to valuation changes** arising from an appreciating U.S. dollar and higher U.S. bond yields.
- External indicators like net international investment position and short-term debt also indicate **lower vulnerability**.
- **India's external debt to GDP ratio is the lowest** among major emerging market economies (EMEs).

Forex Reserves:

- Foreign exchange reserves or forex reserves are assets denominated in a foreign currency that are held by a nation's central bank.
- These may include **foreign currencies, bonds, treasury bills, and other government securities**.

Impacts:

- Elevated imported inflation pressures
- Continuing appreciation of the U.S. dollar
- Withdrawal of monetary accommodation

Possible Implications:

- The **Russia-Ukraine war** could further disrupt the global energy system.

- **Fresh supply concerns** in the winter for critical commodities such as crude oil and natural gas.
- **Inflation control** remains a major concern in developed economies.

Concerns for Global Economy

- Mounting inflationary pressures
- Currency depreciation
- Rising debts
- Shrinking fiscal space

Measures to be taken:

- Adopt a people-centric approach driven by innovation
- Nurture new growth drivers
- Bringing the 2030 Agenda for Sustainable Development back on track

PM MODI INAUGURATES 'ONE NATION, ONE FERTILIZER' SCHEME

- ◎ **CONTEXT:** Recently, the Prime Minister has inaugurated 600 Kisan Samridhi Kendras and the 'One Nation, One Fertilizer' scheme to modernize agriculture.

One Nation, One Fertilizer Scheme:

- The scheme will consist of a "Single Brand for Fertilisers and Logo" under the fertilizer subsidy scheme named "**Pradhanmantri Bhartiya Janurvarak Pariyojna**" (PMBJP).
- The scheme would extend to all four fertilizers – Urea, Di-Ammonium Phosphate, Muriate of Potash, and complex NPK – with '**BHARAT**' pre-fixed.
- The single brand name would be BHARAT UREA, BHARAT DAP, BHARAT MOP, and BHARAT NPK, etc. respectively for all Fertiliser Companies, State Trading Entities (STEs) and Fertiliser Marketing Entities (FMEs).
- Under the scheme, companies are allowed to display their name, brand, logo, and other relevant product information only on one-third space of their bags.
- On the remaining two-thirds of the space, the "Bharat" branded Pradhanmantri Bharatiya Jan Urvarak Pariyojana logo will have to be shown.

Other highlights of the event:

- Launch of Weekly Fertilizer International e-Magazine "**Indian Edge**".
- Inauguration of 600 **PM-Kisan Samruddhi Kendras (PM-KSK)**.

Need of the Initiative:

- India is among the world's largest buyers of fertilizer, besides China, Brazil, and the US.
- **India imports four types of fertilizers:**
 - Urea
 - diammonium phosphate (DAP)
 - muriate of potash (MOP)
 - nitrogen-phosphorous-potassium (NPK)

Significance of the Scheme:

- **Standardization:** This will standardise fertiliser brands across the nation irrespective of the company that manufactures it.

- **Stopping urea diversion:** It will stop the crisscross movement of fertilizers, especially urea. Which leads to its diversion for industrial purposes.
- **Reduced freight charges:** Brand-wise demand for fertilizers in specific areas by farmers is one of the reasons for the crisscross movement of fertilizers. Since fertilizer companies get the freight subsidy, they do not hesitate to move bags a longer distance.
- **Affordability:** The scheme will ensure affordable quality fertiliser of Bharat brand to the farmers. This scheme will result in the reduction of the cost of fertilisers and increase their availability.

Central government subsidy on fertilizers:

- The fertilizer sector is a highly subsidized area. Where the maximum retail price (MRP) is fixed for urea and subsidy is fixed for non-nitrogenous fertilizer phosphate and potassium (P and K).
- Nearly 80 percent of the cost of production of urea and P&K is being paid to fertilizer manufacturers in the form of a central government subsidy.

INS ARIHANT VALIDATES INDIA'S NUCLEAR CAPABILITY

◎ **CONTEXT:** The country's first ballistic missile nuclear submarine (SSMN) INS Arihant has carried out a successful launch of a Submarine Launched Ballistic Missile (SLBM) validating India's second strike nuclear capability.

◎ **BACKGROUND**

- Arihant was launched on **26 July 2009**, the anniversary of Vijay Diwas (Kargil War Victory Day).
- After extensive sea trials, on 23 February 2016, she was confirmed as ready for operations, commissioned in August 2016, and deployed operationally in 2018.
- In November 2019, **India formally declared its nuclear triad**, stated in its nuclear doctrine, operational after INS Arihant has begun prowling the **deep seas** carrying ballistic missiles equipped with nuclear warheads.

Ballistic Missiles:

- A ballistic missile is a type of missile which **uses projectile motion** to deliver warheads on a target. These weapons are guided only during relatively **brief periods**.

About INS Arihant:

- **INS Arihant (SSBN 80)** is a Strategic Strike Nuclear Submarine and the lead ship of India's Arihant class of **nuclear-powered ballistic** missile submarines.
- The **6,000 tonne vessel** was built under the **Advanced Technology Vessel (ATV)** project.
- **Design:** It has four vertical launch tubes, which can carry 12 (three per launch tube) smaller K-15 missiles or four larger K-4 missiles. The K-4 has a longer range of **3,500 km** (2,200 mi).
- **General Features:**
 - **Length:** 111 m
 - **Beam:** 15 m
 - **Speed:** Submerged: 24 knots (44 km/h; 28 mph); Surfaced: 15 knots (28 km/h; 17 mph)
 - **Commissioned:** August 2016
 - **Status:** in active service
 - **Homeport:** Visakhapatnam

The **Agni series** of missiles constitute the **backbone of India's nuclear weapons** delivery, which also includes the **Prithvi** short range ballistic missiles and fighter aircraft.

DEEP IMPACT

The historic launch of India's nuclear submarine adds a new member to what was an exclusive Big Five club

Strategic Punch
12 K-15 short range ballistic missiles with 1 ton nuclear warhead. Can hit targets 700 km away. (To be replaced by 3500 km 'K-X' SLBM in future.)

INS ARIHANT
COST: Rs 3,200 crore

Speed
22 knots dived
25 knots surfaced

Propulsion
1 pressurised water nuclear reactor
1 steam turbine 20,000 shp
7 bladed propeller

Displacement
5,000 tonnes

Dimensions
104 metres long
10 metres wide

Tactical Weapons
Six 533 mm torpedoes/
Klub anti-ship / land attack cruise missiles.

Future Missile
A larger variant of the K-15, the 'K-X', a 3,500-km missile with multiple warheads is in development. The *Arihant* will carry four of them.

The sub was built at SBC, Vizag; it will be launched from here.

Site Bravo is where the sub will be housed for harbour trials.

Akula 2 class sub, being leased from Russia to train ATV crews.

N-SUBS OF THE WORLD	
USA	74
RUSSIA	44
UK	13
FRANCE	10
CHINA	10

RESEARCHERS DETECT BARIUM IN ATMOSPHERES OF 2 EXO-PLANETS

- ◎ **CONTEXT:** Recently, the Scientists have detected barium in the upper atmosphere of two giant exo-planets for the first time. Barium, two and half times heavier than iron, is the heaviest-ever detected element.

What are Exoplanets?

- An exoplanet is any planet beyond the solar system. Most orbit other stars, but free-floating exoplanets, called rogue planets, orbit the galactic center and are untethered to any star.
- Most of the exoplanets discovered so far are in a relatively **small region of our galaxy**, the Milky Way. ("Small" meaning within thousands of light years of the solar system).

Do you Know?

- **Exoplanet Kepler-452b: Similar to Earth or (EARTH-like):** NASA considers exoplanet **Kepler-452b** and its star to be the closest analog to our planet and Sun so far.
- Though it's 60% larger than Earth in diameter, Kepler-452b is thought to be rocky and within the habitable zone of a **G-type star** similar to ours.

About the Study:

- The exoplanets been considered are two **ultra-hot Jupiters** — **WASP-76b** and **WASP-121b** — which orbit their **host stars** WASP 76 and WASP 121 (Named so as they have similar properties like Jupiter)
- They are about **640 light-years** away and **900 light-years** away from the Earth respectively.
- Both WASP-76b and WASP-121b complete one orbit in two days. Surface temperatures in these bodies reach as high as **1,000 degrees Celsius**.
- These bodies have unique features owing to their **high temperatures**. For instance, WASP-76b **experiences 'iron rain'**.
- They also confirmed the presence of hydrogen, lithium, sodium, magnesium, calcium, vanadium, chromium, manganese and iron in the atmosphere of the WASP-76 b, in **addition to barium**.
- **WASP-76b:** The planet was discovered on October 21, 2013 and as of 2022 is the only known planet in its planetary system. It orbits its star at a distance of 0.033 AU with a period of 1.8 days. Its mass is **0.92 times** that of Jupiter.
- **WASP-121b:** WASP-121b is an extrasolar planet orbiting the star WASP-121.
- WASP-121b is the first exoplanet found to contain water in an extrasolar planetary stratosphere

Properties of Barium:

- **Appearance:** Barium is a soft, silvery metal that rapidly tarnishes in air and reacts with water.
- **Occurrence:** Barium occurs only in combination with other elements. The major ores are barite (barium sulfate) and witherite (barium carbonate). Barium metal can be prepared by electrolysis of molten barium chloride, or by heating barium oxide with aluminium powder.
- **Uses:**
 - It is also used in paint and in glassmaking.
 - All barium compounds are toxic; however, barium sulphate is insoluble and so can be safely swallowed. A suspension of barium sulphate is sometimes given to patients suffering from digestive disorders.



- Barium carbonate has been used in the past as a rat poison. Barium nitrate gives fireworks a **green colour**.
- Barium has no known **biological role**, although barium sulphate has been found in one particular type of algae. Barium is toxic, as are its water- or acid-soluble compounds.

Why these metals are unique to be found in the Atmosphere?

- This discovery of barium is surprising because heavy elements like barium are expected to quickly fall (**as these exoplanets have high gravity**) into the lower layers of the atmosphere.
- It revealed some new dynamics inside the atmospheres or gives us insights into the composition of these distant planets.

GSLV MK-III TO LAUNCH '36 ONE WEB' SATELLITES

- ◎ **CONTEXT:** Indian Space Research Organisation's heaviest rocket, **GSLV Mk-III**, is set to launch **36 satellites** of the 'OneWeb communication' constellation. With this the **GSLV Mk-III** will enter the global commercial launch service market.

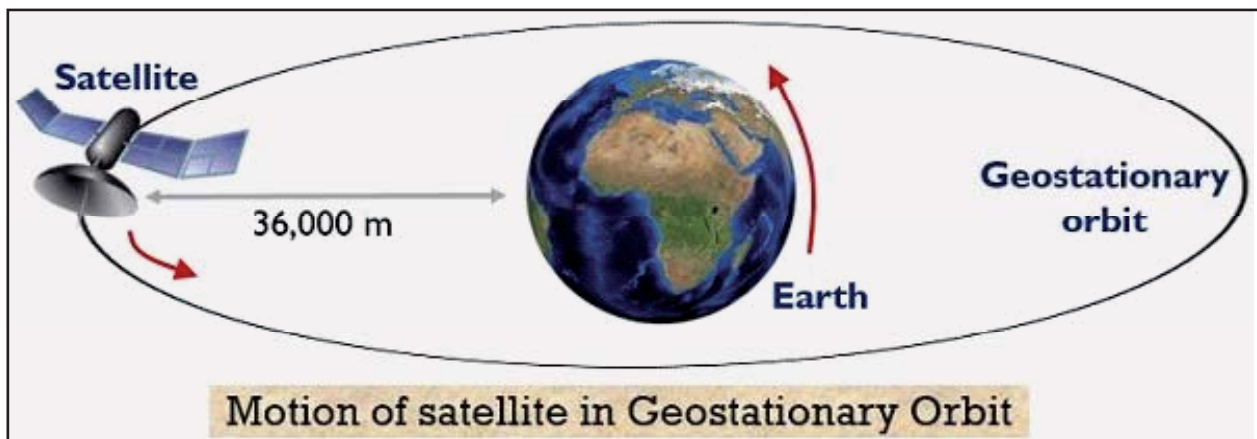
◎ **ABOUT**

- This is the first time that India's heaviest rocket is being used for a commercial launch.

Facts:

India currently has **three operational** launch vehicles – the **PSLV, GSLV, and GSLV Mk III**. The space agency has also developed a small satellite launch vehicle, whose first development flight was partially successful.

- Also, this will be the first time a rocket other than India's workhorse – **Polar Satellite Launch Vehicle (PSLV)** – is being used to carry out commercial launch.
- Till now, the PSLV has conducted at least **eight commercial-only launches**.



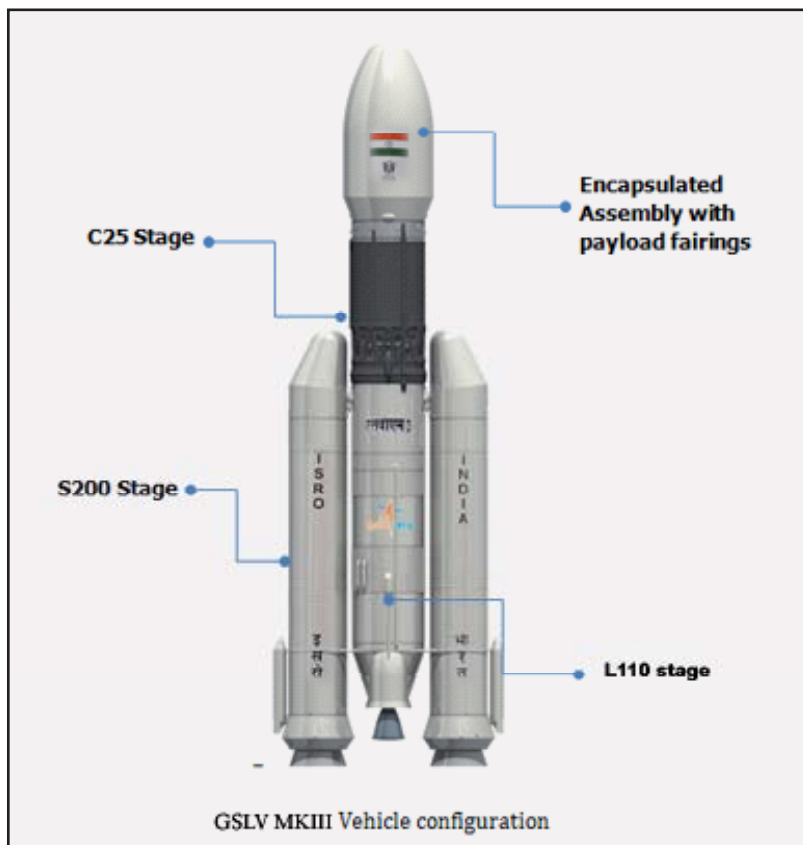
Geostationary Orbit of earth: (Orbit of Communication Satellites)

- A **geostationary orbit** is also referred to as a **geosynchronous equatorial orbit (GEO)**.
- It is a circular geosynchronous orbit 35,786 km (22,236 mi) in altitude above Earth's equator (42,164 km (26,199 mi) in radius from Earth's centre) and following the direction of Earth's rotation.

The GSLV Mk-III rocket:

- The Geosynchronous Satellite Launch Vehicle Mark III (GSLV Mk III), also referred to as the **Launch Vehicle Mark 3 (LVM3)**, is a three-stage, medium-lift launch vehicle developed by ISRO.

- The **three stages** of the LVM3:
 - two solid strap-on motors (S200)
 - one liquid core stage
 - A high-thrust cryogenic upper stage make up the LVM3
- The first successful experimental flight of LVM3 was made in December 2014.
- Primarily designed to launch communication satellites into **geostationary orbit**, it is also identified as the launch vehicle for crewed missions under the Indian Human Spaceflight Programme.
- It was used in dedicated science missions like **Chandrayaan-2**.
- The GSLV Mk III has a **higher payload capacity** than the similarly named GSLV Mk II.
- The GSLV Mk-III will have improvements to increase reliability and safety to meet the requirements of 'human ratings'.



ISRO'S NEXT-GEN LAUNCH VEHICLE

- ◎ **CONTEXT:** Recently, addressing a three-day Engineers conclave 2022, the ISRO chairman has announced to launch Next-Gen Launch Vehicle (NGLV), which is-going to replace operational systems like the Polar Satellite Launch Vehicle (PSLV).

◎ **ABOUT**

What are launch vehicles?

- Launchers or Launch Vehicles are used to carry spacecraft to space. India has two operational launchers:
 - Polar Satellite Launch Vehicle (PSLV)
 - Geosynchronous Satellite Launch Vehicle (GSLV)

Retired Launchers

- SLV-3
- ASLV

What is the New-Gen Launch Vehicle (NGLV)?

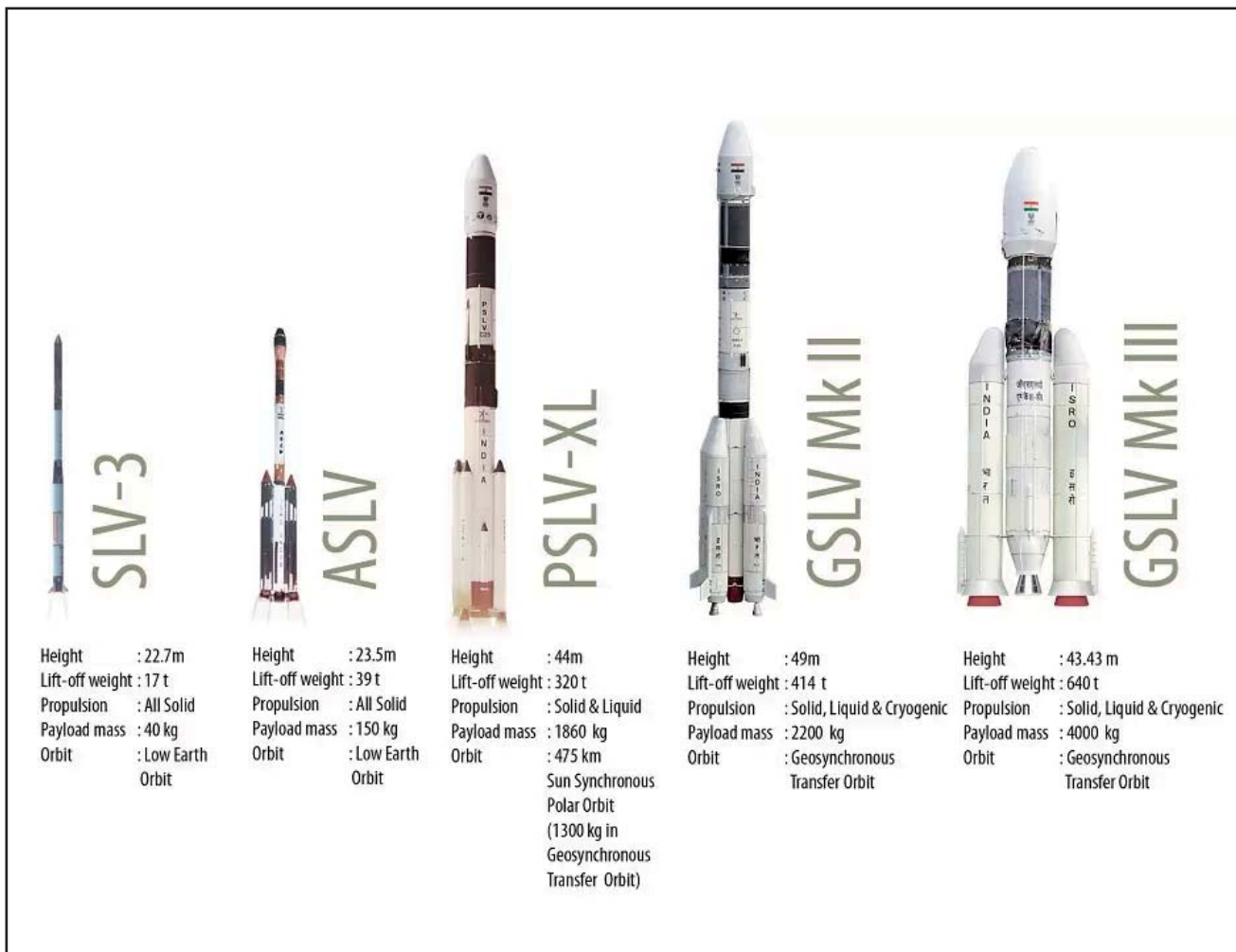
- NGLV is aimed at a cost-efficient, three-stage to orbit, reusable heavy-lift vehicle with a payload capability of ten tonnes to **Geostationary Transfer Orbit (GTO)**.
- It is featured with **semi-cryogenic propulsion** (refined kerosene as fuel with liquid oxygen (LOX) as oxidiser) for the booster stages which is cheaper and efficient.
- **Design:**
 - Design will be simple and robust which allows bulk manufacturing, modularity in systems, sub-systems and stages and minimal turnaround time.

- **Uses:** Potential uses will be in the areas of launching communication satellites, deep space missions, future human spaceflight and cargo missions.

It will replace **the PSLV launch vehicle** and aimed to be more efficient than other launch vehicles of ISRO.

The PSLV:

- Polar Satellite Launch Vehicle (PSLV) is the **third generation** launch vehicle of India.
- It is the **first Indian launch** vehicle to be equipped with **liquid stages**.
- After its first successful launch in **October 1994**, PSLV emerged as a reliable and versatile workhorse launch vehicle of India.
- **Some Successful launches:**
 - Launched two spacecraft "**Chandrayaan-1 in 2008** and **Mars Orbiter Spacecraft** in 2013 that later travelled to Moon and Mars respectively.
 - The launch of **PSLV-C48** marks the 50th Launch of PSLV.
- PSLV earned its title '**the workhorse of ISRO**' through consistently delivering various satellites into low earth orbits, particularly the IRS Series of satellites.
- The PSLV is capable of placing multiple payloads into orbit, thus multi-payload adaptors are used in the payload fairing.



THE ILLUSION OF BEING FASTER THAN LIGHT: HOW A STAR PROBLEM WAS SOLVED

◎ **CONTEXT:** A *jet of particles* released by two colliding stars appears to be moving seven times the speed of light but astronomers blame it to be a cosmic illusion.

◎ **BACKGROUND:**

- Astronomers have detected a **blast of energy** from space that appears to be travelling seven times faster than the speed of light.
- The *jet of particles (ultra-relativistic material)* in question has resulted from the **collision of two neutron stars** located roughly 140 million light-years from Earth.
- The collision was so powerful it created ripples in the fabric of space-time; such disturbances are known as **gravitational waves**.
- According to a study published in the *journal Nature*, the jet of energy blasted out of a collision site at a staggering 99.97% of the speed of light, **certainly not more than the speed of light**.

Neutron stars:

- They are **stellar corpses**, left behind after a star has experienced a supernova explosion and reached the end of its lifetime.
- They are extremely dense, containing more mass than the sun in a sphere that is a few tens of kilometers wide.

How did astronomers make this observation?

- Both **gravitational waves and visible waves** were produced after the Collision. **Large Interferometer Gravitational-Wave Observatory (LIGO)** first detected the Gravitation waves.
- Astronomers at **NASA's Hubble Space Telescope**, and the **European Space Agency's GAIA** space observatory saw visible evidence of a high-speed jet of particles, blazing out of the collision site.
- With these observations, the team calculated both the actual speed of the jet and the perceived physics-defying speed.

Beyond light-speed illusion:

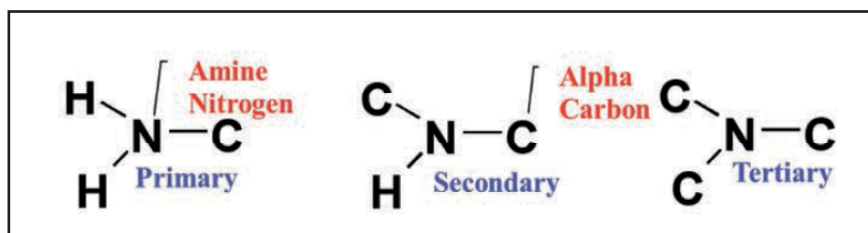
- The *beyond-light-speed illusion* arises from the **difference in speed between the particles in the jet, and the light particles (or photons) that they emit**.
- Because the jet's particles move nearly as fast as the light they emit, it can appear as though **particles in the early part of the jet are arriving at Earth at nearly the same time as photons in the later stages of the jet**, making it appear as though the jet is actually moving faster than the speed of light. Hence, exhibiting **superluminal motion**.
- **Superluminal motion** occurs as a special case of a more general phenomenon arising from the difference between the apparent speed of distant objects moving across the sky and their actual speed as measured at the source.

CAN CARBON CAPTURE BE NEW HOPE FOR MITIGATING CO2 EMISSIONS?

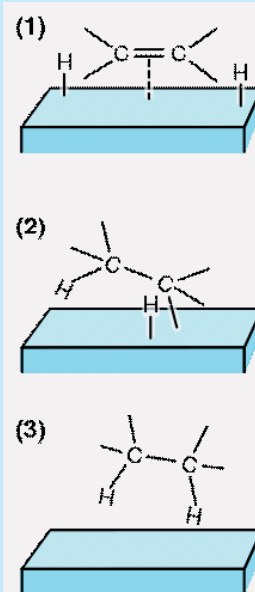
◎ **CONTEXT:** Recently, the NTPC Vindhyachal in Madhya Pradesh limited has taken an initiative to capture the carbon as electricity production by coal accounts for 40% of the CO2 emissions.

© ABOUT

- India stands **third** among the GHG-emitting countries in the world, emitting 2,310 megatons of CO₂ in 2019.
- These scenarios necessitate the mitigation of GHG reduction in the country to combat the effects of climate change.
- The pioneer project of a carbon capture plant installed in NTPC Vindhyachal is in line with this, which is designed to capture **20 tonnes of CO₂ per day**.
- It uses modified '**tertiary amine**' to capture CO₂ from **flue gas** from fossil-fired power plants, with a purity of more than **99 per cent**.
- Tertiary amine (3° amine)**: An amine in which the **nitrogen atom** is directly bonded to three carbons of any hybridization which cannot be carbonyl group carbons.
- CO₂ will eventually be integrated with hydrogen to produce **10 tonnes of methanol** per day through a catalytic **hydrogenation process**.



- Hydrogenation** is a chemical reaction between molecular hydrogen (H₂) and another compound or element, usually in the presence of a catalyst such as **nickel, palladium or platinum**.
- The process is commonly employed **to reduce** or saturate **organic compounds**.
- Hydrogenation typically constitutes the addition of pairs of hydrogen atoms to a molecule, often an alkene.
- Catalysts are required for the reaction to be usable; non-catalytic hydrogenation takes place only at very high temperatures. Hydrogenation reduces double and triple bonds in hydrocarbons.



- Currently, there are no **Carbon Capture, Utilisation and Storage (CCUS)** projects in the pipeline in power plants for carbon capture in India.

The Carbon capture, Utilisation and Storage (CCUS) Technique:





- Carbon capture, utilization and storage (CCUS), also referred to as carbon capture, utilization and sequestration, is a process that captures carbon dioxide emissions from sources like coal-fired power plants and either reuses or stores it so it will not enter the atmosphere.
- Carbon dioxide storage in geologic formations includes **oil** and gas reservoirs, un-mineable coal seams and deep saline reservoirs -- structures that have stored crude oil, **natural gas**, brine and carbon dioxide over millions of years.
- The **Energy Department** supports research and development of tools to assess the environmental fitness and predictability of future capacity within -- proposed geologic storage sites.

76 BUTTERFLY SPECIES COUNTED ACROSS 7 BIODIVERSITY PARKS IN DELHI

- ◎ **CONTEXT:** In the recently observed 'Butterfly assessment week' for Delhi's biodiversity parks, it has found 76 species of butterflies remaining highest in the Aravalli range.

The Butterfly Assessment Week: Data

- The assessment week was conducted by scientists at the biodiversity parks along with **volunteers, students and teachers**.
- A total of **5,922 butterflies** were counted for the year 2022.
- The highest number of species has been found from **Aravalli Biodiversity Park at 68**.
- The **largest populations** were found to be of species like;

Butterfly species	Description
	<p>The Mottled emigrant</p> <p>Mottle markings throughout the under-side and variable cell end patches may have rosy or silver spots. A large black spot on the fore wing cell and broader marginal bands on upper side in females. Some individuals have a bluish appearance on wings. Much smaller individuals can be seen in very dry months. Male is quite smaller than the female.</p>
	<p>Common emigrant</p> <p>Catopsilia pomona, the common emigrant or lemon emigrant, is a medium-sized pierid butterfly found in Asia, Cambodia and parts of Australia. The species gets its name from its habit of migration.</p> <p>Some early authors considered them as two distinct species <i>Catopsilia crocale</i> and <i>Catopsilia pomona</i>.</p>
	<p>Plain Tiger</p> <p><i>Danaus chrysippus</i>, also known as the plain tiger, African queen, or African monarch, is a medium-sized butterfly widespread in Asia, Australia and Africa.</p> <p>The plain tiger is believed to be one of the first butterflies depicted in art. A 3,500-year-old ancient Egyptian fresco in Luxor features the oldest known illustration of this species.</p>
	<p>Lemon pansy</p> <p><i>Junonia lemonias</i>, the lemon pansy, is a common nymphalid butterfly found in Cambodia and South Asia. It is found in gardens, fallow land, and open wooded areas.</p>



Common grass yellow

Eurema hecabe, the **common grass yellow**, is a small pierid butterfly species found in Asia, Africa and Australia.

They are found flying close to the ground and are found in open grass and scrub habitats. It is simply known as "the grass yellow" in parts of its range.

Significance of Butterflies:

- Butterflies and bees are Pollinators, and are an important aspect of any ecosystem.
- They contribute in **regenerating forests** which can be very difficult without pollinators.
- The habitats created for butterflies also tend to attract bees. The butterflies can be good indicators of the **quality of habitats**, according to scientists.

List of Delhi's Biodiversity Parks:

- A total of **7 Biodiversity Parks** have been notified by Delhi Development Authority, of which two are fully functional and others are being developed.
- **They are namely as;**
 - Yamuna Biodiversity Park
 - Aravalli Biodiversity park
 - Kamla Nehru Biodiversity Park
 - Tilpath Valley Biodiversity park
 - Neela Hauz Biodiversity park
 - Kalindi Biodiversity Park
 - Tughlaqabad Biodiversity Park
- These Biodiversity Parks are owned by **Delhi Development Authority** and form a part of urban infrastructure and have educational, conservation and cultural values, besides rendering a wide range of ecological services.
- In the year 2012, **Yamuna Biodiversity Park** was dedicated to the nation by former Lt. Governor of Delhi Shri Tejendra Khanna and **Aravalli Biodiversity Park** was dedicated to the nation by Hon'ble Lt. Governor of Delhi Shri Najeeb Jung, in the year 2015.

Section: D

(QUICK BYTES)

CURRENT AFFAIRS

INTERNATIONAL E-WASTE DAY

- ◎ **CONTEXT:** International E-Waste Day is held on October 14 every year as an opportunity to reflect on the impacts of e-waste.

The theme for the year 2022 is 'Recycle it all, no matter how small!'.

What is E-waste?

- E-Waste is short for Electronic-Waste and the term is used to describe old, end-of-life or discarded electronic appliances. It includes their components, consumables, parts and spares.
- It is categorised into 21 types under two broad categories:
 - ▶ Information technology and communication equipment.
 - ▶ Consumer electrical and electronics.



Government Initiatives for E-waste management:

Initiatives such as

- **Extended Producer Responsibility**
- **Design for Environment**
- **(3Rs) Reduce, Reuse, Recycle technology platform for linking the market facilitating the circular economy** aim to encourage consumers to correctly dispose of the e-waste.

Agencies responsible

- National Green Tribunal (NGT)
- Central Pollution Control Board (CPCB)






SIX SPIDER SPECIES DISCOVERED ACROSS THE COUNTRY

- ◎ **CONTEXT:** Arachnologists from the Centre for Animal Taxonomy and Ecology (CATE), Christ College, Irinjalakuda in Kerala have recently discovered six new species of spiders from across the country.

◎ **ABOUT:**

- The new species of spiders were found from the Garo hills in Meghalaya, the Thar desert of Rajasthan, Wayanad Wildlife Sanctuary, Kottappara hills near Kothamangalam, Thumbboormuzhi butterfly garden near Athirappilly, and the University of Calicut campus.

◎ **NEW SPIDER SPECIES DISCOVERED:**

<p>Flat Spiders:</p> <ul style="list-style-type: none"> • Siamspinops garoensis: It was discovered in the Garo hills in Meghalaya. It belongs to the family of flat spiders, Selenopidae. This spider lives in the crevices of rocks on hills and its flat body is suitable for this mode of life. 	
<p>Jumping spiders:</p> <ul style="list-style-type: none"> • Afraflacilla miajlarensis: It was discovered in the Thar desert of Rajasthan. It belongs to the family of jumping spiders (Salticidae). It is characterized by white fine hairs on a black head and black horizontal lines on the abdomen. This spider stays among dry leaf blades. 	
<ul style="list-style-type: none"> • Afraflacilla kurichiadensis: It was discovered from Wayanad, Kerala. It belongs to the family of jumping spiders (Salticidae). It is characterized by red patches around the eyes and white hairs on the abdomen. The bulged first pair of legs are also a special feature of this species. This spider lives in the moist deciduous forest of Kurichiyad. 	
<p>Feather- legged spiders:</p> <ul style="list-style-type: none"> • Philoponella rostralis: It was discovered in Kottappara hills near Kothamangalam, Kerala. The species lacks a venom gland and belongs to the family of feather-legged spiders (Uloboridae). 	
<p>Spiny-legged spiders:</p> <ul style="list-style-type: none"> • Oxyopes peetham: It has been discovered in Thumbboormuzhi butterfly garden, near the Athirappilly waterfalls, Kerala. It belongs to the family of spiny-legged spiders (Oxyopidae). It is characterized by a yellowish body. 	

- **Oxyopes thumboormuzhiensis**: It has been discovered at **Calicut University campus, Kerala**. It belongs to the family of spiny-legged spiders (Oxyopidae). It aims to signify the locality where the spiders were spotted.



These findings have been published in the latest volume of **Zootaxa (New Zealand)**, **Arthropoda Selecta (Russia)**, **British Journal of Arachnology (England)**, **Acata Arachnologica (Japan)** and **Serket (Egypt)**, international journals that deal with spider study.

SIX VARIETIES OF NEELAKURINJI IDENTIFIED IN WESTERN GHATS

- ◎ **CONTEXT:** Recently, a team of Experts has observed six varieties of Neelakurinji in Western Ghats which indicated the need to conserve the ecosystem for them and their habitat.

◎ **ABOUT**

- **Neelakurinji** are flowers that are believed to bloom **every 12 years**.
- They grow at an altitude of 1300 to 2400 metres.
- Neelakurinji or 'Strobilanthes kunthiana' blooms in 40 or so varieties, a majority of them being **blue in colour**.
- '**Neela**' literally translates to '**blue**' and **kurinji** is the name given to it by the **tribals of the area**.
- Last seen in 2018, the time for viewing them begins in **August** and lasts up to **October**.
- In Munnar District, these flowers bloom across the region of **Kovilur, Kadavari, Rajamala and Eravikulam National Park**.
- Alongside **Strobilanthes kunthiana**, the types of neelakurinji flowers that have been identified from the hill ranges includes;
 - ▶ Strobilanthes anamallai,
 - ▶ Strobilanthes heyneanus,
 - ▶ Strobilanthes pulneyensis, and
 - ▶ Strobilanthes neoasper.



Prime Minister **Narendra Modi** also referenced the neelakurinji in his **Independence Day speech** in 2018, a year when the neelakurinji was in bloom.

- All these neelakurinji species are endemic to the **Western Ghats** and spread over nearly 200 acres of the Kallippara hills.

- In fact, the neelakurinji population here can be considered one of the biggest of the species after the **protected areas of Munnar**.

12th EDITION OF DEFEXPO TO BEGIN IN GUJARAT

- ◎ **CONTEXT:** With an aim to give impetus to the defence sector, India's 'biggest ever' defence exhibition – DefExpo 2022 is going to begin in Gandhinagar, Gujarat from October 18 to 23.

About the DefExpo 2022:

- This is the **12th edition** of the event that has been organised on the theme '**Path to Pride**'.
- **Objective:** DefExpo 2022 aims to showcase the growing prowess of the domestic defence industry, calling it one of the major drivers of the nation's resolve to achieve '**Make in India, Make for the World**'.
- It is a **biennial exhibition (organised every Two year)** that has been organised to support, showcase and forge partnerships for the Indian aerospace and defence manufacturing sectors with Indian as well as global customers.
- The Expo event is exclusively for **Indian companies**, as a humble tribute of an 'Aatmanirbhar Bharat' to Mahatma Gandhi who he called the "**pillar of the Swadeshi movement**".
- DefExpo 2022 will be the **first-ever edition** exclusively for Indian companies.
- **Indian Participants for the Event:**
 - Indian companies,
 - Indian subsidiaries of Foreign OEMs,
 - Division of a company registered in India, and
 - Exhibitor having a Joint Venture with an Indian company will be considered as Indian participants.
- This edition has the largest participation so far and is spread over **one lakh square metres** with **75 countries, 33 Foreign Ministers, 1,340 Indian companies** and **10 State pavilions**.
- **Events listed:** As part of the DefExpo, live demonstration by the Army, the Navy, the Air Force, the Coast Guard and the DRDO, showcasing land, naval and air procedures, and systems in action will be done at the '**Sabarmati River Front**'.

The India-Africa Defence Dialogue (IADD):

- The first IADD was held in **Lucknow**, Uttar Pradesh, during DefExpo 2020 and the 'Lucknow Declaration' was adopted at the end of the conclave as an outcome document.
- A similar 'Gandhinagar document' will be adopted at the IADD.
- The IADD will explore new areas of convergence for mutual engagement, including in areas like capacity building, training, cyber security, maritime security and counter terrorism,

JAPAN SEEKS GI TAG FOR NIHONSHU, AN ALCOHOLIC BEVERAGE

- ◎ **CONTEXT:** The Embassy of Japan, New Delhi, has filed an application seeking a Geographical Indication (GI) tag for nihonshu/Japanese sake, an alcoholic beverage.

What is Nihonshu?

- Though usually referred to as "**Sake**", its official name is "**Nihonshu**" in Japan.
- "Nihonshu" means a liquid that is produced in Japan and made by fermenting and filtering rice, koji, and water.

- People traditionally drink nihonshu on special occasions, such as festivals, weddings or funerals, but it is also consumed on a daily basis.
- Thus, it is an integral part of the lifestyle and culture in Japan.

Process of making Nihonshu:

- For making nihonshu **three main raw materials: Rice, koji-kin (a type of fungal spore) and water – are required.**
- The **rice and koji used** should **originate in Japan.**
- The production of nihonshu follows an **alcoholic fermentation** method called parallel **multiple fermentation** and involves the raw material treatment, koji making, starter culture-making, mash making, pressing, heat sterilisation and bottling.

Microbes used for brewing Nihonshu:

- **Koji mould:** Convert rice starch into sugars
- **Yeast:** Convert sugar into alcohol
- **Lactic acid bacteria:** Prevent bacterial growth of other microbes

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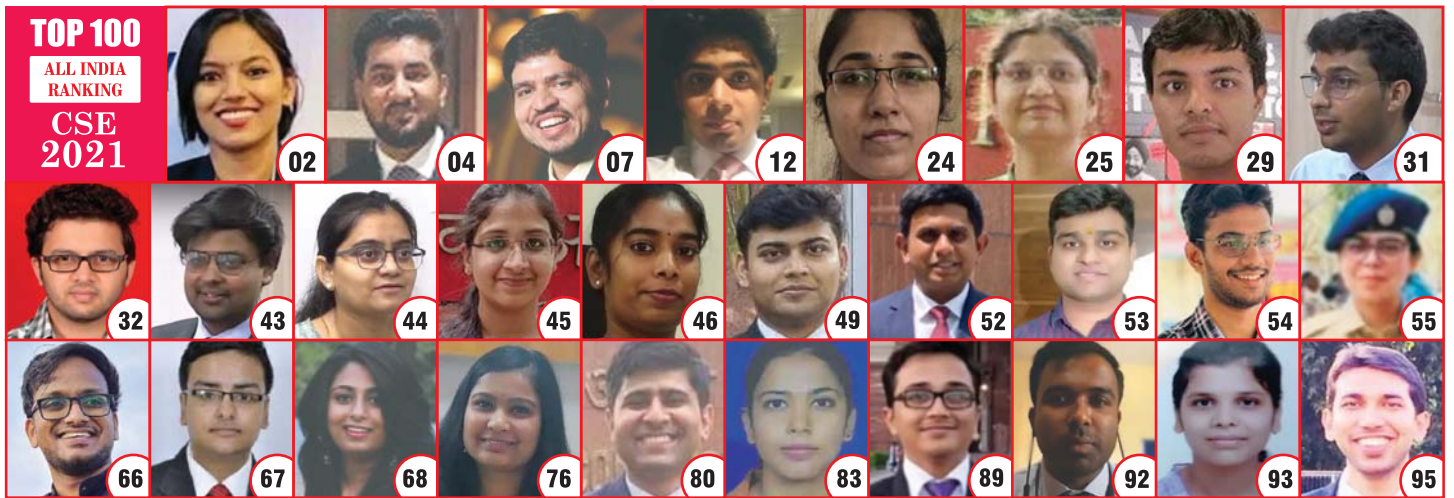
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