



**SIVARAJAVEL IAS ACADEMY**  
AN IDEAL INSTITUTE FOR **CIVIL SERVICE EXAMS**

# the **CATALYST**

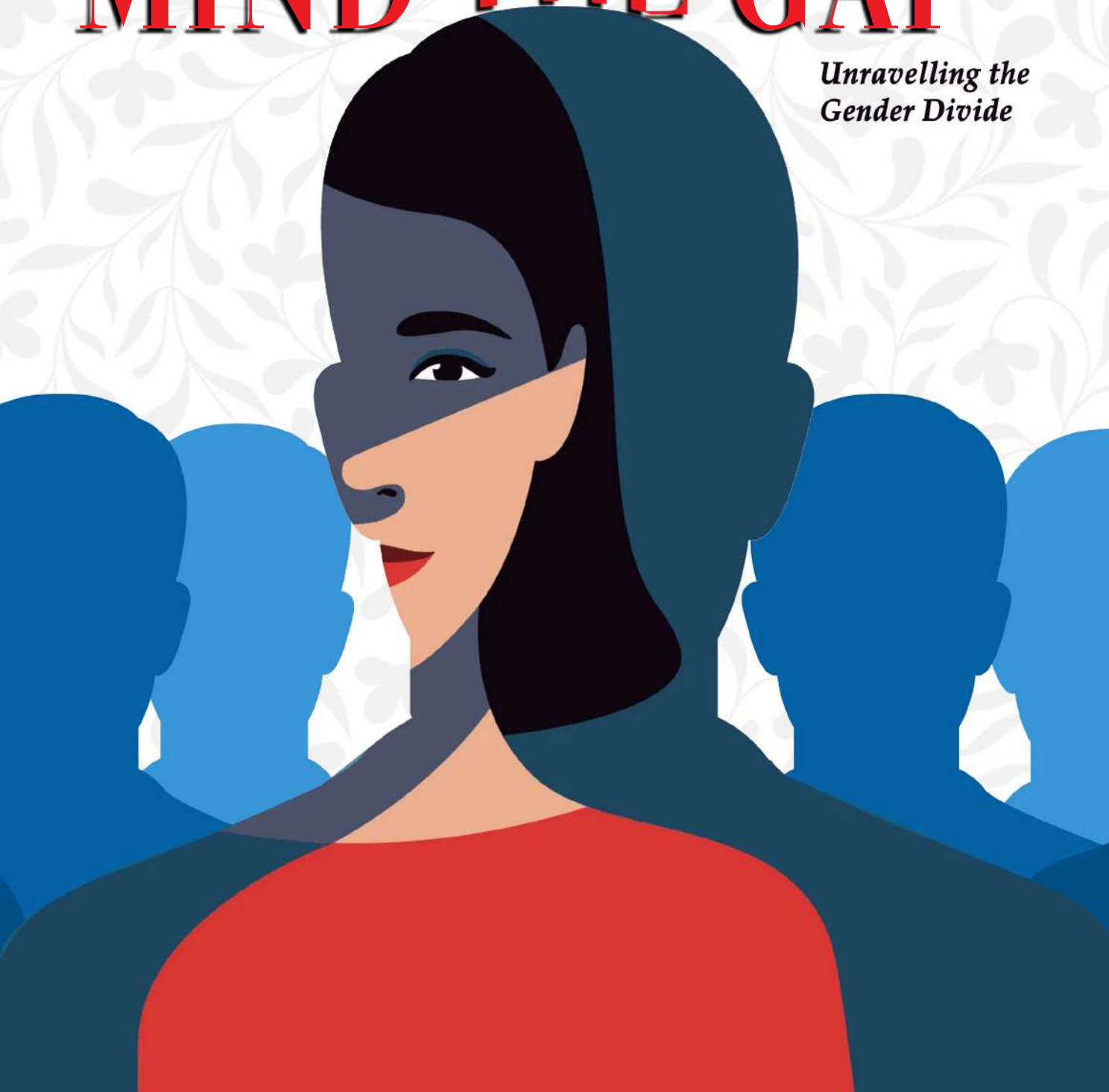
**A Monthly Publication for Current Affairs**

**JUNE - 2023**

**SPECIAL EDITION**

# **MIND THE GAP**

*Unravelling the  
Gender Divide*



**JUNE 2023**

# The **CATALYST**

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

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

## **Inside The Catalyst Magazine**

- I. Special Coverage
- II. Within the Sub themes first few topics will be Prelims oriented followed by indepth coverage of Mains Topics.
- III. Book Summary Relevant for UPSC Exam.
- IV. Fact Sheet and Quotes have also been provided.

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

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**SIVARAJAVEL IAS ACADEMY**

AN IDEAL INSTITUTE FOR **CIVIL SERVICE EXAMS**

# the **CATALYST**

## From the Editor's Desk

Dear Readers,

For the New aspirants who have enrolled in One Year Batches or those doing self-studies, it is quite likely that you may be going through an overwhelming feeling - (some from insecurity, some from fear, some from confidence, etc). UPSC preparation is a process that is slow. It always takes the longer route. The sheer vastness of the syllabus and the realization that still there is so much to be done can at times make us weary and deprive us of the enthusiasm that we carried when we started this preparation. Remember that

“Nothing great was ever achieved without enthusiasm”. There needs to be a motivation within you to keep pushing yourself. Be wary of flimsy motivation or little bouts of energy that wanes off quickly.

I would also like to congratulate our Catalyst team member Mr. Ravi Muthu. M, who has been a key contributor in our Content Development for clearing the Bank PO and SSC exam. We wish him all the best in his future endeavours. I welcome on board Mr. Saravanan as the new member of Team Catalyst. A **Special Story “Mind the Gap”** has been included for this month.

In this June Issue (From June 1 to June 30, 2023, Current Affairs), we have covered **a range of topics with special emphasis on Women’s Issues, UCC, Law commission on sedition, Indo-France Relations, Strategic Gas Reserves, Odisha Train Tragedy etc.** This month’s Book summary is on **“Digital Minimalism”** by Cal Newport.

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

Sincerely,  
P.Mohan

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# MIND THE GAP

UNRAVELLING THE GENDER DIVIDE

In this special edition of our magazine, we explore the profound insights provided by the recently released “**Global Gender Gap Report**” by the World Economic Forum. This groundbreaking report examines the progress made by various countries in their quest for gender parity.

We present a comprehensive analysis of gender gaps across four pivotal sectors :

## 1. Health

## 2. Bureaucracy

## 3. Climate change

4. **Mobility**, which has come across various news articles this month. By delving into these domains, we aim to broaden your understanding of the multifaceted issues faced by women and offer you fresh perspectives on the path towards gender equality.

According to the ILO, gender gap refers to “*the differences between women and men that are socially*

*constructed and culturally determined.*” This definition emphasises that *gender gaps are not inherent but arise from societal norms and expectations* that result in unequal treatment and opportunities for women and men.

The World Economic Forum (WEF), an international organisation known for its Global Gender Gap Report, defines the gender gap as “the difference between women and men as reflected in social, political, intellectual, cultural, or economic attainments or attitudes.” The WEF’s approach encompasses multiple dimensions and indicators to measure gender disparities across various spheres of life.

In terms of social and cultural aspects, the gender gap manifests in societal expectations, stereotypes, and norms that shape the roles and behaviour of men and women. These expectations often limit women’s access to education, employment opportunities, leadership positions, and decision-making processes. Women may face discrimination, bias, and unequal treatment in various areas, such as healthcare, property rights, and legal protection.

## GENDER GAP REPORT 2023

It is published by the **World Economic Forum**. It is the longest-standing index tracking the progress of numerous countries’ efforts towards closing

these gaps over time since its inception in 2006.

The Global Gender Gap Index annually benchmarks the current state and evolution of gender parity across four key dimensions

1. Economic Participation and Opportunity

2. Educational Attainment

3. Health and Survival

4. Political Empowerment

## Findings

The global gender gap score in 2023 for all 146 countries included in this edition stands at 68.4%.

At the current rate of progress, *it will take 131 years to reach full parity.*

*India has closed 64.3% of the overall gender gap, ranking 127th on the global index.*

While the global parity score has recovered to pre-pandemic levels, the overall



rate of change has slowed down significantly.

According to the 2023 Global Gender Gap Index **no country has yet achieved full gender parity**, although the top nine countries have closed at least 80% of their gap.

Iceland continues to be the only country to have closed more than 90% of its gender gap.

Of the 117 countries with available data since 2017, 18 — including Bolivia (50.4%), India

(44.4%) and France (42.3%) — have achieved women's representation of over 40% in local governance.

**Gender gaps in the global labour market persist**, with women facing **lower labour-force participation rates**, higher unemployment rates, and limited representation in leadership positions.

Women also remain **underrepresented in STEM fields** and face disparities

in accessing online learning platforms.

Political leadership positions also show gender imbalances, although there have been some positive trends. India has attained parity in enrolment across all levels of education.

The gender gap manifests in various fields and sectors, leading to disparities between men and women. Here are some common forms of the gender gap in different areas:

## GENDER GAP IN HEALTH SECTOR

The difference in the anatomy between various genders implies that diseases and their symptoms may affect them differently. Moreover, some diseases affect certain genders more than others, while a few

early onset of depression “are less likely to obtain college degrees and less likely to pursue postgraduate degrees”. We see the **vicious cycle of women's underrepresentation here.**

between men and women.

### A. Gender Bias in Treatment, Testing, Diagnosis

Women have been either overdosing, as in the case of Zolpidem, a common sleep medicine, or not getting enough, as in the case of several pain medicines, for decades.

Women faced the challenge of a gender gap in testing, diagnosis and treatment, which arose from **a lack of comprehensive research about conditions dominant among women and biases toward women in healthcare.**

Equal representation of genders in clinical trials, and impartiality and unbiasedness in testing and diagnosis help in creating a healthcare system that addresses the needs of all genders.

### B. Gender Disparity in Funding

Gender disparity is also observed in research funding. Sex-specific illnesses such as



# WOMEN'S HEALTH MATTERS

are gender-specific conditions. Thus, it is imperative to look through a **gendered lens for a better understanding of diseases.**

According to experts, nearly one-fifth of medications showed a difference in the active dose between men and women. The women with an

The medical field still predominantly follows a **male-oriented approach**, disregarding the increasing evidence of physiological differences between men and women beyond reproductive organs. Extensive research highlights **genetic, epigenetic, and physiological distinctions**



breast or endometrial cancers, polycystic ovarian syndrome, and pregnancy-related issues, there are serious gaps in research that can only be explained by an apathy towards “women’s only” issues.

Women in general are more susceptible to mental illnesses than men. A similar trend can also be observed among other diseases or conditions such as depression, Alzheimer’s, anxiety disorders, migraines and headaches. Funding received for research in migraine, endometriosis and anxiety disorders is much lower in proportion to the burden of these illnesses.

If men menstruated there would be several multi-million dollar projects studying cramps’ — this meme is not funny any more when you look at mortality numbers because of poor reproductive health. **Diseases which affect men more received relatively higher funding than those which affected women.**

### C. Gender Parity in Clinical Trials

The gender gap was not

only observed in terms of funding but also recorded during clinical trials.

In India, the “pharmacy of the world”, the gender disparity in clinical trials has even bigger implications. It has been **demonstrated in various studies that women’s bodies respond differently to the components of generic drugs.**

In some fields of medicine such as oncology, psychiatry, neurology and cardiology, **the disease burden was higher among women while their share in clinical trials was not proportionate.**

The exclusion of women from clinical trials and research projects addressing sex-agnostic critical illnesses such as cancer and heart disease has resulted in a limited understanding of **sex-specific symptoms and responses to treatment.**

World Health Organization data from 2017 show that “every day about 808 women die due to complications of pregnancy and childbirth”. Almost all of these were preventable but occurred “due to interaction between pre-

existing medical conditions and pregnancy”. **Pregnant women are further down the ladder of representation in clinical trials and research.**

Women are less likely to receive appropriate medications, diagnostic tests and clinical procedures even in developed countries such as Canada and Sweden as the **stereotype of the “hysterical woman”** continues to haunt women even when they need urgent clinical interventions.

Therefore, it is crucial to implement appropriate interventions, create awareness within the medical community to mitigate bias and push for gender-sensitive clinical trials and equitable allocation of research funding.

India has several progressive policies with respect to women’s health including the right to abortion. It is time for **policy intervention in the space of sex-specific research in medicine and the implementation of outcomes.**

## CLIMATE CHANGE , WOMEN & GENDER GAP

Climate change is one of the greatest global challenges of the twenty-first century. Its impacts vary among regions, generations, age, classes, income groups, and gender. However, the impact of climate change on gender is not the same. Women are more vulnerable to climate change than men.

### Why are women more vulnerable?

Women’s vulnerability to climate change stems from a number of factors -- social, economic and cultural.

1. Women represent the majority of the world’s poor and are proportionally more dependent on threatened natural resources.

2. Women have less access than men to resources such as land, credit, agricultural inputs, decision-making structures, technology, training and extension services that would enhance their capacity to adapt to climate change.

3. Women have limited access to and control of environmental goods and services; they have negligible

participation in decision-making, and are not involved in the distribution of environmental management benefits. Consequently, *women are less able to confront climate change.*

4. In many societies, *socio-cultural norms and childcare responsibilities prevent women from migrating or seeking refuge in other places or working when a disaster hits.* Such a situation is likely to put more burden on women, such as travelling longer to get drinking water and wood for fuel.

## CLIMATE CRISIS AND DOMESTIC VIOLENCE

Climate change will be an added stressor that will aggravate women's vulnerability. It is widely known that during *conflict, women face heightened domestic violence, sexual intimidation, human trafficking and rape.*

During extreme weather such as *droughts and floods, women tend to work more to secure household livelihoods.* This will leave less time for women to access training and education, develop skills or earn income.

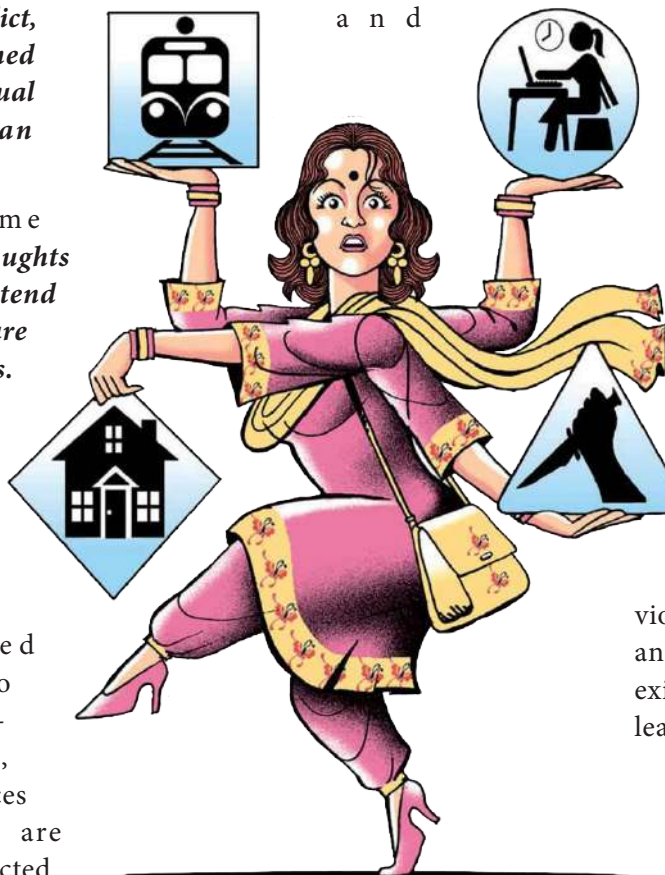
When coupled with inaccessibility to resources and decision-making processes, limited mobility places women where they are disproportionately affected by climate change.

Climate crisis and domestic violence are interconnected in several ways, as climate change can contribute to an increase in domestic violence and exacerbate existing patterns of abuse.

Here are some key connections between the two:

**1. Displacement and increased stress:** Displaced populations, due to natural hazards, often face heightened levels of stress, insecurity, and economic hardships. These factors can create a tense and volatile environment, increasing the risk of domestic violence within households.

**2. Resource scarcity and competition:** Climate change-induced resource scarcity can escalate household and



community tensions, creating power imbalances and raising the risk of domestic violence as people compete for essential resources.

**3. Increased vulnerability and social inequality:** The existing vulnerabilities can be further exacerbated by the impacts of climate change, making women more susceptible to domestic violence. Limited access to resources, education, healthcare, and legal support can impede women's ability to escape or seek assistance in abusive situations.

**4. Disruption of support networks:** Climate change disrupts support networks and community structures, isolating domestic violence survivors due to relocation and damaged infrastructure. It intersects with other forms of violence, like gender-based and sexual violence, intensifying risks during displacement and after natural disasters. This amplifies the complexity of domestic violence dynamics.

**5. Mental health impacts:** Climate change-related events can cause emotional distress, anxiety, and trauma, straining relationships and increasing domestic violence. The associated stress and trauma may exacerbate existing mental health issues, leading to violent behaviour.

## HEAT WAVES AND DOMESTIC VIOLENCE - Case Study

India might witness a rise in domestic violence against women due to climate change: A study *published in JAMA Psychiatry*.

The study found a 1C increase in average annual temperature was connected to a rise of more than 6.3% in incidents of physical and sexual domestic violence across three south Asian countries.

The study tracked 194,871 girls and women aged 15-49 from India, Pakistan and Nepal between 2010 and 2018, and their reported experiences of emotional, physical and sexual violence. It compared that data with temperature fluctuations across the same period.

India, which already had the highest reported rates of intimate partner violence of the three, also had the biggest increase in abuse: With a 1C rise in heat came an 8% rise in physical violence, and 7.3% rise in sexual violence.

The study also shows that every one degree Celsius increase in the annual mean temperature, they noted a total of 4.49 per cent Intimate partner Violence (IPV) prevalence.

While many countries already count deaths from heat-related illness during heatwaves, they would not capture the hidden toll of a heat-related rise in women killed in domestic violence incidents.

## GLASS CEILING EFFECT IN INDIAN BUREAUCRACY

Women constitute almost half of the population of the nation, however their participation in the top decision-making position is not significant. For Example, In June 1991, P V Narasimha Rao, the 10th prime minister, appointed a number of bureaucrats, technocrats, and politicians to usher in the liberalisation of India's economy. His team, whose decisions affected the lives of all Indians, comprised solely of men.

### Lack of Participation of women in top decision-making process of government:

First, there just weren't enough women in the Indian Administrative Services (IAS) to begin with. Recruitment rules were skewed in favour of men. For instance, only unmarried women could join the services and had to quit if they subsequently married. It was after the marriage disqualifier was removed that the ratio of women to men in the IAS went

from 1:82 in 1960 to 1:8 in the 1970s.

Second, such **structural changes happened too late**. Thus, by 1991 when Rao was putting together his team, **women officers were either too junior in rank or ongoing systemic issues kept them out of senior positions**.

Third, even with entry barriers gone, postings were overshadowed by mistrust in women's abilities. Women have largely been seen fit for only

“ **Glass Ceiling Effect** - It refers to the **invisible barriers or** metaphorical barriers and **obstacles** that hinder the advancement of individuals ,particularly women and minorities ,to higher positions of leadership and power within organisations .It prevents qualified individuals from progressing beyond a certain level in their careers ,despite their skills ,qualifications ,and aspirations. ”

“soft” departments. India still hasn’t boasted a woman as RBI governor, cabinet secretary, or chief economic advisor.

### **Women have immense potential but they lack opportunity**

Talent, however, was never the problem. India has had female civil servants who were as deserving as their male colleagues, if not more, to be holding senior postings in the core ministries. Some of the examples are

**1. Renuka Viswanathan, the first woman district magistrate in Karnataka,** Her file was pushed to Rajiv Gandhi’s office that had just appointed Sarla Grewal as India’s first woman principal secretary to the prime minister. Gandhi intervened and deemed Viswanathan best suited for the finance ministry.

**2. Sudha Pillai,** who would be robbed of the chance to become India’s first woman cabinet secretary in the aughts,

as joint secretary in the industry ministry worked *on amending the anti-monopoly law.*

**Janaki Kathpalia,** additional secretary (budget), worked closely with Manmohan Singh in preparing *the union budgets from 1991-1995.* Sindhushree Khullar, then commerce minister P Chidambaram’s private secretary, oversaw significant changes in trade policy

### **Women’s participation at international level**

Organisations like the IMF and the World Bank served as revolving doors through which talent came to India. But in all these years, this group has largely comprised men, including the position of executive director (India) to the World Bank to this day. This is also a fallout of the fact that these *financial institutions did not have female leadership from even the developed nations until the 2000s.*

### **Current position of women in civil services**

Today, the problem of “few” does not loom as much. *Of the 933 candidates selected in the latest round of the union civil service examinations, 320 were women, the highest ever.* They also secured six spots in the top 10, including the top four ranks, repeating last year’s record. *These trends are promising as they indicate that more women, competent no less, are entering the bureaucracy than before.*

However, these numbers do not indicate how many will reach top leadership positions in the services, particularly in the ministries of finance, commerce and industry, home, and defence.

Therefore, With the rise in the number of women entrants, the services have yet another chance to reflect on their talent retention and advancement policies such that the high decision making positions are not just a preserve of men.”

## **GENDER GAP IN URBAN MOBILITY**

Access is gendered, whether it is to land, money, property, rights, or even skills. Transport is no different. The everyday mobility of women is not determined by simple factors like availability or proximity

to transportation but a set of complex issues. This article explores different concepts around women’s mobility especially in urban spaces

of the mode of transport than men, resulting in their opting for slower modes of transport since faster modes tend to be more expensive.

### **Women’s Unique Mobility Patterns**

#### **1. Preponderance of public transport usage**

It is even higher amongst women from lower income groups, who typically have lower discretionary incomes.

Women are more likely to consider the affordability

**2. Travelling within Limited Geographical Radius** - Women tend to travel shorter distances within a limited geographical radius due to restrictive socio-cultural norms.

**3. Walking & Cycling** - Women primarily depend on walking because there is no direct economic cost to it. Though cycling is a good alternative, usage is quite low

“Transport plays a dual role - as a service to be consumed, and as a connection to opportunities.”

due to social stigma and/or harassment faced on the street.

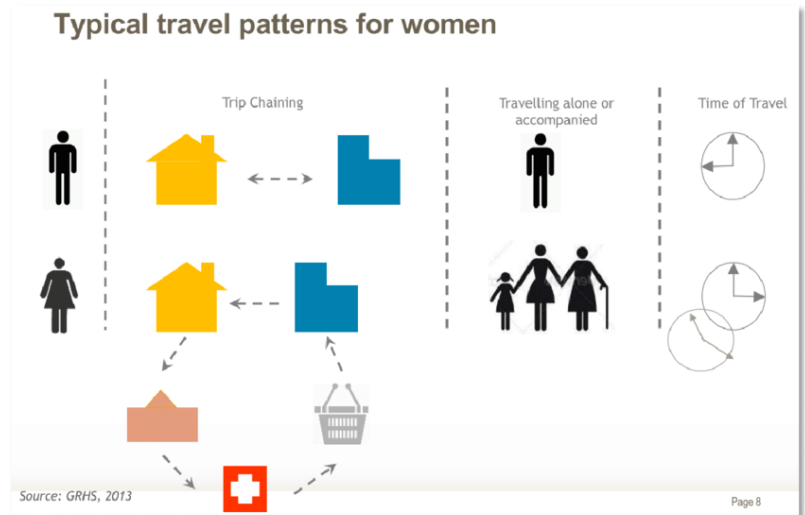
#### 4. Informal Nature of Work

- Women's formal workforce participation is low at 14.7 percent. Women are mostly employed in the informal sector in our country, due to which most workplaces that women travel to are not in the central business districts of cities, facing the crisis of minimal buses across such areas.

#### 5. Trip chaining

Women need to balance household and work responsibilities, they typically combine multiple tasks necessitating several short trips, that is, trip chaining, rather than taking a unimodal, long trip from origin to destination.

Consequently, they end up paying higher fares for frequently



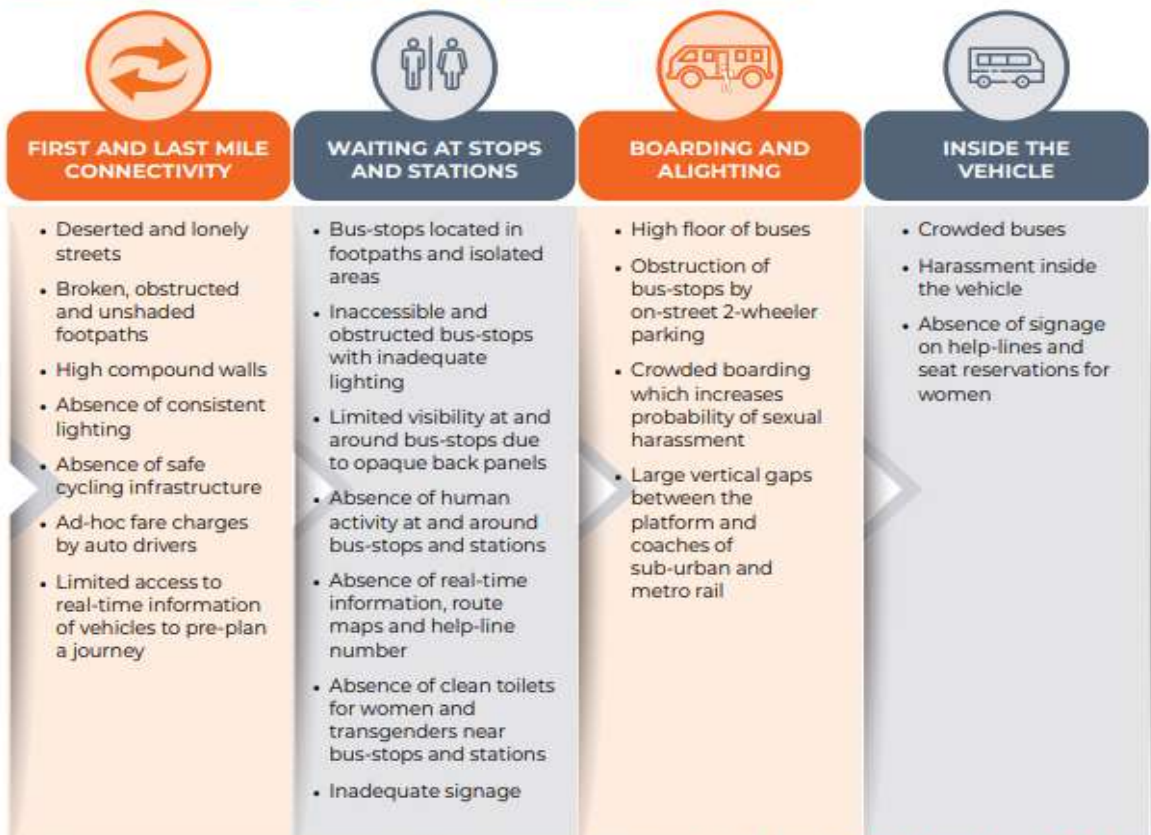
changing direction, modes of transport, and breaking their journeys.

#### 6. Mobility of Care & Off-Peak hour Travelling

Women's trips also tend to be during off-peak hours. Owing to their care work responsibilities, women often

leave the house after the men have left for work and before the children come back from school—hours during which the frequency of public transport is lower, thus increasing their waiting time. They also have off-peak needs that are often underserved.

#### Barriers across the four stages of a public transport journey



Women are more likely to travel with dependents during off-peak hours for unpaid care work, often referred to as mobility of care

## Factors affecting Women's Mobility

The World Bank states that women's mobility is affected by restrictive socio-cultural norms, a lack of safe and sufficient transport infrastructure, gender-blind planning and governance, and a lack of access to information and communication technology.

### 1. Restrictive socio-cultural norms

Gender norms and expectations reinforce traditional gender roles and limit their mobility. Societal pressure discourages women from pursuing opportunities outside the home, including travel. As a result, women may be less familiar with routes, signages, and fare options making them hesitant to commute.

#### a. Burden of unpaid Care work

Women bear a disproportionate burden of unpaid care work in India. Indian women perform 10 times the amount of unpaid work as men, far higher than the global average of 3 times. It leads to Time Poverty and limits the women's freedom of Movement.

Children's school timings and locations also prevent women from having their own travel plans because women are still held responsible for the care of children.

### b. 'Time poverty'

Women's trip planning is often influenced by the need to balance domestic and work commitments, such as children's school timings and family members' schedules.

They have limited time to allocate for commuting and may have to abandon trips if faced with long waits or delays in transportation.

#### Repercussions

Women turn down better-paying jobs if the travel conditions are not safe, require travel at odd times of the day, or do not satisfy other lifestyle conditions.

Limited time for education, skill development, or paid employment due to caregiving responsibilities can impact their financial independence, reducing their ability to afford transportation expenses and make independent travel decisions.

### 2. Lack of safe Public transport options

The lack of safety in public spaces and public transport remains the most concerning aspect of mobility. Even in cases where individual women have not faced any direct form of violence, the fear of what might happen/ 'Perception of Safety', lack of effective grievance redressal mechanisms, and dysfunctional emergency helplines continues to be a deterrent.

Study after study show disturbing trends of high levels of sexual harassment faced by

women while waiting for or using public transport. The harassment that women face is normalised. This limits women's movement and the distances they travel alone.

**PINK TAX** - Women with the ability to pay, accept higher costs for accessing safer means of transport, amounting to the equivalent of a 'pink tax.'

#### Repercussions

Lack of safety deters women from stepping out, creating a vicious cycle that lowers their presence in public spaces.

### 3. Gender Blind Planning and Governance

Women face barriers in using public transport owing to gender-blind design elements during access and egress, waiting at stops and transfers, boarding and alighting, and inside the vehicle.

Failure to recognize and account for women's unpaid care work and informal labour in planning and governance can result in the undervaluing of their contributions to the economy and society.

Inefficient urban mobility systems, characterized by unpredictability and difficulty in transferring between modes, disproportionately affect women.

Transport planning typically **caters to the needs of men employed in the formal sector**, who travel from **periphery to centre** in the morning and back in the evening.

It does not cater to the travel patterns and needs of a large portion of women, particularly

those working in the informal sector and those involved in mobility of care.

### Repercussions of Gender Blind Planning in Mobility

Mobility is the primary connection between women and opportunities for economic independence and bears a huge impact on women's empowerment.

1. Barriers to women's mobility actively restrict their choices around education and employment.

2. A disproportionate burden on women to navigate and overcome transportation challenges.

3. Gender-blind planning perpetuates gender stereotypes by failing to recognize and address the specific challenges faced by women and reinforces societal norms that restrict women's mobility and perpetuates traditional gender roles, hindering efforts towards gender equality and empowerment.

4. Limited financial

resources and economic disadvantage intersect with women's ability to access transportation and move freely within society.

5. It overlooks the specific safety concerns faced by women during travel. Lack of safety measures, such as well-lit pathways, secure waiting areas, and reliable security personnel, leaving women vulnerable to harassment, assault, or other forms of violence.

6. Gender-blind planning can lead to social exclusion and

WOMEN	PATTERNS	MEN
<i>Travel shorter distances and are limited to a more restricted geographical area</i>	Distance of Travel	<i>Travel longer distances</i>
<i>Engage in more non-work-related travel such as household and core related work</i>	Purpose of Travel	<i>Travel mostly for paid work activities</i>
<i>Travel with dependents</i>	Travel Companion	<i>Travel Solo</i>
<i>Undertake chained trips</i>	Trip chaining	<i>Take more point to point transport from home to workplace</i>
<i>Travel during off-peak hours</i>	Period of travel	<i>Travel during peak hours</i>
<i>Pay additional travel costs for trip-chaining safety and other reasons known as Pink Tax</i>	Hidden Cost of Travel	<i>Spend less on transport</i>
<i>Use public transportation/ and Non Motorised Transportation as the main modes of transport</i>	Means of Transport	<i>Have access and use personal modes of transport</i>
<i>Undertake more frequent changes in mode</i>	Changing mode of transport	<i>Use fewer modes to get to their destination</i>
<i>Value flexibility, convenience and safety very highly</i>	Determinants in the choice of transport	<i>Consider saving time highly and safety as a lesser issue</i>

**#gender\_is\_not\_coloured**

particularly those from marginalised or vulnerable communities. It can perpetuate discrimination based on factors like caste, ethnicity, or disability, further limiting opportunities for empowerment and inclusion.

7. Women may opt for lower-paying jobs, delay healthcare visits, or discontinue education/training due to transportation limitations.

Hence, there is a need for a city-level, gender-disaggregated analysis to understand the differential mobility patterns and provide services to cater to the needs of all. Women's active participation and involvement in urban planning can ensure gender-responsive decision making.

### Way Forward

As We better understand and make critical connections between gender, Mobility, Health, Climate Change and Social equity, it's high time we take action towards the solutions.

**E m p o w e r w o m e n** smallholders (small-scale farmers who manage agricultural areas up to 10 hectares, or roughly 25 acres) - Increasing the productive capacity of women smallholders helps to promote sustainable agricultural practices. They tend to rely on more diverse and climate-resilient crops, represent a sustainable alternative to our current model of agricultural production.

Invest in care - Unpaid and underpaid care work is not valued in accordance with its worth. Governments should

treat care work like a collective good, expanding its availability and providing adequate support to Women

Support women's leadership - Women's representation and leadership have been associated with positive environmental outcomes. Women tend to implement more stringent climate change policies and effective management of natural resources at the local level promotes fair and inclusive governance, resulting in improved conservation efforts.

Fund women's organisations - Government collaboration with women's organisations can help ensure that climate policies meet the specific needs of women and girls, and that such policies are effectively implemented.

Protect women's health - Women will bear the brunt of climate-linked negative health outcomes like negative sexual and reproductive health impacts. As with other crises and disasters, climate change also increases vulnerability to gender-based violence.

Ending discrimination in law and practice - It requires comprehensive reforms to ensure equal rights, opportunities, and protections for women, paving the way for a more inclusive and just society.

Envisioning a sustainable economy with gender equality at its core - Improving female labour force participation rate and ensuring Women's equal access to financial services not only unlocks economic potential, but also gives women a say in their own financial decisions.

Eradicating poverty, through gender-responsive social protection and public services

Ensuring equal access to social assistance, healthcare, and education, as well as targeted support for women in low-income households, single mothers, and marginalised groups

Improving access to quality public services, such as healthcare, education, and clean water, is crucial in reducing poverty and empowering women

Promoting equal access to education and skills development - Ensuring equal opportunities to quality education and skill-building programs. Addressing barriers such as gender stereotypes, cultural norms, and financial constraints that limit girls' access to education and training.

The introduction of free bus travel schemes in States like New Delhi, Punjab, Tamil Nadu, Karnataka and the installation of CCTV cameras in buses demonstrate a commitment to improving public transportation and making it more accessible, safe, and convenient. These initiatives not only benefit individuals by providing affordable travel options and enhancing security but also contribute to Women empowerment and Economic progress.

With inputs from,

**Ms. Shanmugapriya.N**



# POLITY & GOVERNANCE

What's Inside?



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2. 22ND LAW COMMISSION'S RECOMMENDATION ON SEDITION
3. GENERAL CONSENT TO CBI
4. DELHI GOVT. HAS CONTROL OVER BUREAUCRATS, RULES SC

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## UNIFORM CIVIL CODE

*GS-I Indian Constitution—historical underpinnings, evolution, features, amendments, significant provisions and basic structure.*

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## LATERAL ENTRY IN CENTRAL GOVERNMENT

### Why in news:

The Government has decided to recruit 17 senior officers in the Central government from the private sector through lateral entry.

This is the fourth such recruitment drive proposed to be undertaken by the government which had in 2018 initiated lateral entry to bring fresh talent and augment the availability of manpower.

### About Lateral Entry:

The term lateral entry relates to the appointment of specialists, mainly those from the private sector, in government organisations. Committees' recommendations on lateral entry:

The idea has been advocated by Surinder Nath Committee (2003), Hota Committee (2004) and Second ARC (2008).

NITI Aayog, in its three-year Action Agenda (2017—2020), recommended the induction of personnel at middle and senior management levels in the central government.

<u>Arguments in Favour of Lateral Entry</u>	<u>Arguments Against Lateral Entry</u>
Twin objective of bringing in fresh talent and augmenting manpower.	Difficulty adjusting to bureaucratic work culture.
Domain expertise synthesized with the multi-sectoral wisdom of the permanent civil service.	Short tenures are not conducive to holding accountability.
Increasing complexity in governance (e.g., digitalization, financial frauds, cybercrime)	Lack of field experience.
Increased efficiency through competition within governance.	Need for a transparent process

## 22ND LAW COMMISSION'S RECOMMENDATION ON SEDITION

The 279<sup>th</sup> report of the Law Commission of India recommending the retention of the sedition law has brought the 153-year-old colonial law to the centre stage yet again.

### About Section 124A of IPC

Section 124A of the Indian Penal Code (IPC) incorporated in 1870, describes the Law of Sedition.

The colonial law was derived from the British Sedition Act of 1661.

It seeks to punish speech or writing that brings or tries to bring into hatred or contempt, or excites or tries to excite disaffection towards,

the government established by law.

### Recommendations of the 22<sup>nd</sup> Law Commission

The law commission report has recommended the retention of the highly debated Sedition law, which is under Section 124A of the Indian Penal Code.

It broadly recommended three things:

1. Widening the scope of sedition.
2. Adding a higher quantum of punishment.
3. Incorporating 'procedural safeguards' to prevent misuse.

While Section 124A provides for a minimum imprisonment of 3 years, the commission recommends a minimum of 7 years in the name of national security.

The Law Commission has suggested that the tendency to incite disorder should be incorporated in Section 124A.

It clarified that in democratic India sedition laws would only be used against the ‘tendency to incite violence or cause public disorder’.

The commission defines tendency as a slight inclination and is decided by a policeman.

Any alleged misuse of Section 124A of IPC should not be a reason to repeal the law and it should be reined in by laying down adequate procedural safeguards

## Criticism against the recommendation

The Commission recommends for the enhancement of punishment when there is a universal demand for the scrapping of this law.

It attempts to bring *sedition within the framework of reasonable restriction under Article 19(2)*.

The law of sedition in Section 124A of the IPC is *considered a colonial vestige* and unconstitutional in a democratic country.

Disaffection towards a government *should not be an offence in a democratic republic* where the people have the freedom to change a bad government.

## GENERAL CONSENT TO CBI

Tamil Nadu government has recently withdrawn the general consent given to the Central Bureau of Investigation (CBI).

### About General Consent to the CBI

Under the provisions of the Delhi Special Police Establishment Act, 1946, the CBI is required to obtain prior permission from the concerned state government before initiating an investigation in a state.

This provision ensures a cooperative framework between the CBI and state authorities, respecting the state’s autonomy in matters of investigation and law enforcement.

The CBI’s position is in this respect different from that of the National Investigation Agency (NIA), which is governed by The NIA Act, 2008, and has jurisdiction all over the country.

*Consent given by a state government to the CBI can come in two forms, either ‘case-specific,’ or ‘general’.*

### General consent

When a state gives general consent to the CBI for probing a case, the agency is not required to seek fresh permission every time it enters that state in connection with an investigation or for

every case.

Withdrawal of general consent also means that the CBI will not be able to register any fresh case involving central government officials or private persons in a particular state without the prior permission of that state government.

### ‘Case-specific’ consent

In contrast, if the CBI does not have the general consent of a state government, it is required to apply for consent on a case-by-case basis and cannot act before the consent is given.

If specific consent is not granted, the CBI officials will not have the power of police personnel when they enter that state.

# DELHI GOVT. HAS CONTROL OVER BUREAUCRATS, RULES SC

## Why in News?

The Supreme Court verdicts on two crucial cases - the Delhi government's tussle with the Centre over the national capital's bureaucracy, and the Maharashtra political crisis that followed the fall of the Uddhav Thackeray government have two things in common.

Both rulings draw new red lines for Constitutional offices in the face of political compulsions, and underline the sanctity of the elected government. Both rulings are essentially political battles decided one way or the other in a courtroom.

## SC verdicts

In the Delhi ruling, the apex court speaks to the Centre in emphasising that principles of democracy and federalism are basic structure of the Constitution.

Also, the court emphasised on a **“triple chain of accountability”** to read the Constitutional provisions expansively and allow Delhi government control over services. The bench said that the triple chain of accountability flows from bureaucrats to ministers, ministers to the legislature, and the legislature to the electorate.

“The interpretation of Article 239AA(3)(a) in an expansive manner would further the basic structure of federalism”.

# UNIFORM CIVIL CODE

*GS-I Indian Constitution—historical underpinnings, evolution, features, amendments, significant provisions and basic structure.*

## Context

Recently, Prime Minister Narendra Modi emphasised the crucial need for the implementation of a Uniform Civil Code (UCC) in India. Also the 22nd Law Commission has recently issued a fresh notification on June 14th, seeking to solicit viewpoints from a wide range of stakeholders, including public and religious organisations, on the matter of the Uniform Civil Code (UCC).

The UCC elicits diverse perspectives and discussions, primarily owing to its inherent implications for women's rights.

## What is Uniform Civil Code (UCC)?

A Uniform Civil Code would provide for one law for the entire country, applicable to all religious communities, in their personal matters such as marriage, divorce, inheritance, adoption, etc. The framers of the Constitution recognised the need for uniform personal laws, but placed it in the Directive Principles of State Policy.

Article 44 of the Constitution says that “the State shall endeavour to secure for the citizens a uniform civil code throughout the territory of India”. Article 44 is among the Directive Principles of State Policy.

Directive Principles are not enforceable by court, but are

supposed to inform and guide governance. Currently, Indian personal law is fairly complex, with each religion adhering to its own specific laws. Separate laws govern Hindus including Sikhs, Jains and Buddhist, Muslims, Christians, and followers of other religions.

## Benefits of UCC

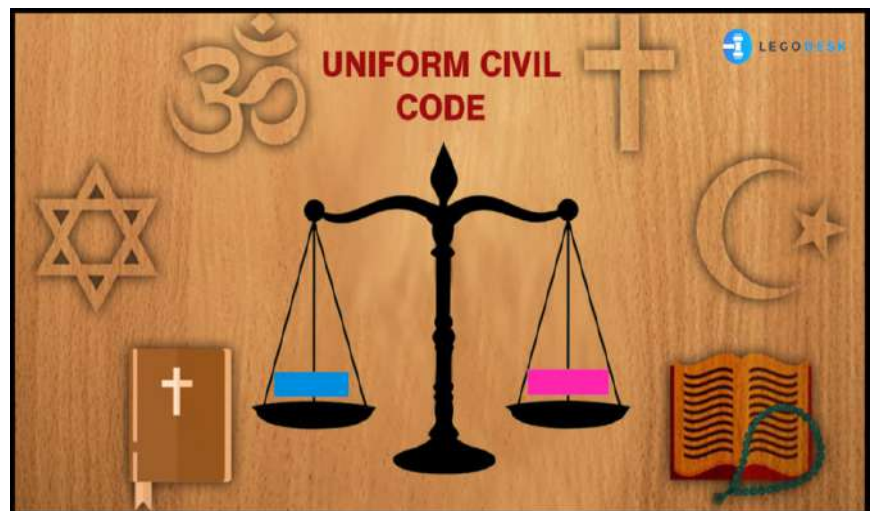
UCC can protect against discrimination in matters pertaining to divorce, maintenance, adoption and succession.

The UCC seeks to establish a common set of civil laws for all citizens, regardless of their religion and culture, thereby promoting equality and ensuring justice for all.

cause of national integration. In the constitutional order of priorities, the right to religious freedom is to be exercised in a manner consonant with the vision underlying the provisions of Part III (Fundamental Rights”).

Sarla Mudgal (1995): Court said: “It appears that the rulers of the day are not in a mood to retrieve Article 44 from the cold storage where it has been lying since 1949. The governments have so far failed to make any effort towards unified personal law for all Indians.

Indian Young Lawyers Association case (2018): In the constitutional order of priorities, the right to religious



## Judicial stand

Shah Bano case: “It is a matter of regret that Article 44 has remained a dead letter.” The Court had pointed out that a UCC would help the

freedom is to be exercised in a manner consonant with the vision underlying the provisions of Part III (Fundamental Rights).” Personal laws should be constitutionally compliant and in conformity with the

norms of gender equality and the right to live with dignity. The supremacy of fundamental rights over customary law ensures that various freedoms guaranteed to all citizens under the Constitution are safeguarded.

## The essence of UCC

The UCC is a step to safeguard the fundamental rights of all citizens and reduce social inequalities and gender discrimination.

It is an attempt at creating a unified legal framework that upholds the principles enshrined in the Constitution and reaffirmed by Supreme Court judgments.

Objective is to ensure that there is no gender discrimination, everyone enjoys the fundamental rights enshrined in the Constitution, and that the law of the land is uniform for every citizen in our country.

It will serve as a powerful instrument for the promotion of equality and justice for all citizens.

## Arguments in favor of UCC

**Uniformity in cases:** India does have uniformity in most criminal and civil matters like the Criminal Procedure Code, Civil Procedure Code etc.

**Gender Justice:** If a UCC is enacted, all personal laws will cease to exist. It will do away with gender biases in existing laws.

**Secularism:** A secular nation needs a common law for all citizens rather than differentiated rules based on religious practices.

**Various communities in India:** Example: All Hindus are not governed by a homogenous personal law even after the enactment of the Hindu Code Bill.

**Shariat Act:** There is no uniform applicability when it comes to the Muslim personal law or the Shariat Act 1937.

**Hindu Marriage Act of 1955:** It prohibits marriages amongst close relatives but they are considered auspicious in the south of India.

**Hindu Succession Act of 1956:** Wives are not coparceners (a person who shares equally with others in the inheritance of an undivided estate) nor do they have an equal share in inheritance.

## Arguments against UCC

**Plurality in already codified civil and criminal laws:** So concept of 'one nation, one law' cannot be applied to diverse personal laws of various communities.

**Constitutional law experts:** Framers did not intend total uniformity.

Example: Personal laws were placed in Concurrent List (power to legislate being given to Parliament and State Assemblies).

**Customary laws:** Many

tribal groups in the country, regardless of their religion, follow their own customary laws.

**Communal Politics:** The demand for a uniform civil code is considered to be framed in the context of communal politics.

**Article 25:** It seeks to preserve the freedom to practice and propagate any religion.

## What 21st Law

### Commission says?

The 21st Law Commission exhibited a strong inclination towards prioritising gender equality within communities, as opposed to pursuing equality between communities.

In accordance with paragraph 1.15 of its comprehensive 182-page report titled "Consultation Paper on Reform of Family Law," the commission acknowledged that although the diversity of Indian culture is worthy of appreciation, it is imperative to ensure that certain groups or marginalised segments of society are not subjected to disadvantageous treatment during this endeavour.

The resolution of this conflict does not entail the complete elimination of all differences. The Commission has thus addressed legislation that exhibits discriminatory characteristics, rather than advocating for the implementation of a uniform civil code, which is deemed unnecessary and undesirable

at this particular juncture. Many nations are currently transitioning towards acknowledging and accepting diversity. It is important to note that the mere presence of diversity does not necessarily indicate discrimination, but rather signifies a thriving democratic society.

### **Way Forward**

Major awareness efforts are needed to reform current personal laws. This should be initiated and undertaken by

the communities themselves. Legal intervention should be undertaken only if a practice violates fundamental rights of citizens (especially women).

The social transformation from diverse civil code to uniformity should be gradual. Therefore, the government must adopt a piecemeal approach and refrain implementing all aspects in single legislation. Matters related to marriage, divorce, inheritance, etc. can be dealt separately taking up one issue/matter at a time

There should be an in-depth study and wider consultation involving all stakeholders including academia, constitutional experts, religious and political leadership. This will ensure better formulation and greater acceptability.



# INTERNATIONAL RELATIONS



What's Inside?

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INDO-PACIFIC ECONOMIC  
FRAMEWORK FOR PROSPERITY  
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## ATLANTIC DECLARATION

### Why in news?

On 8 June 2023, the United States and the United Kingdom announced the Atlantic Declaration for a Twenty-First Century **U.S.-UK Economic Partnership** to ensure that our unique alliance is adapted, reinforced, and reimagined for the challenges of this moment.

### About

Britain and the United States backed a new “Atlantic Declaration” for greater cooperation on pressing economic challenges in areas like clean energy, critical minerals and artificial intelligence.

The joint declaration described the partnership as the “first of its kind” in covering the broad spectrum of the two countries’ economic, technological, commercial and trade relations.

### Areas of cooperation –

1. Strengthening of supply chains
2. Civil nuclear partnership
3. Safe development of AI technology
4. Critical minerals agreement - UK firms to access tax credits available under the U.S. Inflation Reduction Act
5. Cooperation on telecoms technology – 5G, 6G and quantum technology
6. UK – US data bridge - it easier for British businesses to transfer data freely to U.S. organisations without red tape.

### New Atlantic Charter

In 2021, US President Joe Biden and UK Prime Minister Johnson signed a new version of the ‘Atlantic Charter’ . The new Atlantic Charter is a 600-word document that reaffirms the joint commitment of the US and the UK on a range of issues such as national security, climate change, covid 19, emerging roles of technology. It alluded to a “shared responsibility to maintain their collective security and international stability” and committed to defend “the principles, values, and institutions of democracy.” ***It also maintained that NATO will “remain a nuclear alliance” for as long as there are nuclear weapons.***

### Atlantic Charter 1941

The Atlantic Charter is a pivotal document that emerged during World War II, specifically on August 14, 1941. It was a joint statement issued by the British Prime Minister Winston Churchill and the American President Franklin D. Roosevelt during their meeting on board the HMS Prince of Wales, which took place off the coast of Newfoundland, Canada.

The Atlantic Charter outlined the goals and principles that the United Kingdom and the United States shared for a post-war world. It articulated a vision for a future based on democracy, self-determination, and the protection of basic human rights. Although the charter was not legally binding, it had a significant impact on shaping the post-war international order.

## NATO PLUS FIVE

### Why in News?

The U.S. Senate’s India Caucus Co-Chairs, has introduced legislation to give India ‘NATO plus five’ defence status.

US want India to be a part of NATO plus, a group allied with ‘Western’ military powers.

India’s inclusion in NATO Plus is being suggested to counter China and enhance the deterrence for Taiwan.

### About ‘NATO plus five’

The arrangement currently exists between the U.S., its NATO partners and five countries: Australia, New Zealand, South Korea, Japan and Israel.

The announcement follows a recommendation from the House of Representatives committee on China that India be included in the club.

‘NATO plus 5’, is a security arrangement that

brings together NATO and five aligned nations to boost defence and intelligence ties.

### Concerns for India

If India joins the US-led NATO alliance which is backing Ukraine in the current war with Russia, it will directly impact India's strong, established and deep ties with Russia.

US wants to cut off Russia and gain India's defence deals and benefit from its strategic location in the Indo-Pacific.

NATO membership may also affect India's

strategic autonomy over its nuclear arsenal. European Parliament reports on EU strategic autonomy 2013-2023 mentioned how European nations fear that increasing their strategic autonomy may lead to constraints in free trade.

Till now, India does not host any foreign military base on its turf – but joining NATO Plus would mean the US will eventually have a military base in India as well.

Being part of NATO would essentially mean that India will get dragged into America's conflicts.

## ILO MONITOR ON THE WORLD OF WORK

### Why in news:

The ILO Monitor on the World of Work database provides access to several of the indicators related to the labour market.

### Latest trends:

The war in Ukraine, effects of COVID-19 pandemic, have resulted in the ongoing cost-of-living crisis, especially in developing countries.

Countries face a trade-off in managing expected inflation, exchange rate movements, debt sustainability and economic activity.

Various global shocks and risks are holding back labour market recovery, especially in low- and middle-income countries.

Unemployment and the jobs gap: Global unemployment is likely to return to the pre-pandemic level in 2023.

### Highlights of the ILO Monitor (11th edition):

In 2023, the global jobs gap (periods during one's professional career when s/he did not have secure, formal employment) is projected to stand at 453 million people (11.7%), more than double the level of unemployment.

Low-income countries in debt distress face a jobs gap of 25.7% in 2023.

Some countries are facing complex and cascading crises, like natural disasters (e.g. the

earthquakes in Turkiye and Syrian Arab Republic), which interact with broader global challenges and exacerbate labour market impacts.

Significant social protection policy gaps remain in developing countries, especially in low-income countries, including in regard to old-age pensions.

Only 38.6% of older persons in lower middle-income countries receive an old-age pension.

Case of India: Unemployment rate declined sharply in 2021 and 2022, falling to 4.8%, which is almost 2 percentage points below its level of 2019 (6.5%).

### Some of the labour reforms in India:

Labour falls under the Concurrent List of the Constitution.

The central government replaced the 29 existing labour laws with four Codes. These Codes regulate: (i) Wages, (ii) Industrial Relations, (iii) Social Security, and (iv) Occupational Safety, Health and Working Conditions.

eShram: This portal will help build a comprehensive National Database of Unorganised Workers (NDUW) in the country.

PM Shram Yogi Maan-dhan (PM-SYM): Meant for old age protection and social security of Unorganised workers.

Aam Admi Bima Yojana: Providing social security to unorganised sector workers.

## Recommendations:

Building a national social protection floor: For example, by expanding basic old-age pensions in developing countries.

This will act as a catalyst for inclusive sustainable development and decent jobs.

Policies and financial support: To build

resilience and overcome the global employment divide.

Build global financial resources: The UN Global Accelerator on Jobs and Social Protection, and the Global Coalition for Social Justice can play a positive role here.

## INDIA-FRANCE-UAE MARITIME PARTNERSHIP EXERCISE

### Why in the News?

The first edition of India, France and UAE Maritime Partnership Exercise was recently held.

### About

The Exercise commenced on 07 Jun 23 in the Gulf of Oman.

INS Tarkash and French Ship Surcouf both with integral helicopters, French Rafale aircraft and UAE Navy Maritime Patrol Aircraft are participating in the exercise.

The exercise scheduled over two days will witness a wide spectrum of naval operations such as Surface Warfare, involving tactical firing and Drills for Missile engagements on surface targets,

Helicopter Cross Deck Landing Operations, Advanced Air Defence Exercise and Boarding operations.

The exercise would also include cross embarkation of personnel for exchange of best practices.

The maiden exercise aims to enhance trilateral cooperation between the three navies and pave the way for adopting measures towards addressing traditional and non-traditional threats in the maritime environment.

The exercise will also enhance collaboration in ensuring safety of mercantile trade and freedom of navigation at high seas in the region.

## INITIATIVE ON CRITICAL AND EMERGING TECHNOLOGY (iCET)

### Why in News?

India and the United States unveiled a roadmap for enhanced collaboration in high-technology areas, with a focus on addressing regulatory barriers and aligning export controls for smoother trade and “deeper cooperation” in critical areas. This was part of the Initiative on Critical and Emerging Technology (iCET) announced by President Joe Biden and Prime Minister Narendra Modi last year.

### What is iCET?

The Initiative on Critical and Emerging Technologies is a framework agreed upon by

India and the U.S. for cooperation on critical and emerging technologies in areas including artificial intelligence, quantum computing, semiconductors and wireless telecommunication.

It was launched in January this year to strengthen their strategic partnership and drive technology and defence cooperation. Mr. Modi and Mr. Biden first announced the framework on the sidelines of the Quad meeting in Tokyo in May 2022.

### Key takeaways of iCET include

Setting up a research agency partnership to drive collaboration in areas like AI;

Developing a new defence industrial cooperation roadmap to accelerate technological cooperation for joint development and production;

Developing common standards in AI; developing a roadmap to accelerate defence technological cooperation and ‘innovation bridge’ to connect defence startups;

Supporting the development of a semiconductor ecosystem;

Strengthening cooperation on human spaceflight;

Advancing cooperation on development in 5G and 6G; and adopting OpenRAN network technology in India.

## Other recent initiatives between US and India

In addition, a new initiative to advance cutting-edge technology cooperation, known as the India-U.S. Defence Acceleration Ecosystem (INDUS-X), is set to be launched.

India and the U.S. have also concluded a roadmap for ‘Defence Industrial Cooperation’ to guide the policy direction for the next few years. The two countries have also established a Strategic Trade Dialogue to remove regulatory “barriers” and review existing export control norms to take forward strategic technology and trade collaborations envisaged under iCET.

## INDIA AS A QUAD – LED BIOMANUFACTURING HUB

In March 2021, the Quad (Australia, India, Japan, and the United States) set up a Critical and Emerging Technology Working Group to facilitate cooperation, monitor trends, and scout for opportunities related to developments in critical and emerging technologies, that included biotechnology.

However, the potential for Quad cooperation in biotechnology remains insufficiently tapped. The establishment of a Quad-led biomanufacturing hub in India will give the necessary fillip to enhance this cooperation.

### Biomanufacturing

Biomanufacturing involves the use of living systems, especially microorganisms and cell cultures, to generate molecules and materials on a commercial scale.

This technology can revolutionize the global industrial system. An estimated 60% of the physical inputs to the global economy are potentially producible by this method.

### Challenges in creation of Quad-led biomanufacturing hub in India

Dominance of China in small-molecule active pharmaceutical ingredients (APIs) is a concern.

Scaling up the biomanufacturing sector in India necessitates improving the quality of its workforce.

While India has many life science professionals, they often lack access to cutting-edge technology and training.

### Potential of creating biomanufacturing hub in India

India’s *National Biotechnology Development Strategy* also envisions the country as a “*Global Biomanufacturing Hub*” by 2025. While the strategy sets a target of \$100 billion for the hub, it is important to recognise that India’s ambitions require external support, particularly through its Quad partners, to enable its initial development.

Specifically, the Quad should establish a biomanufacturing hub in India to benefit from the country’s economic potential and address supply-chain vulnerabilities. Quad nations have complementary strengths that can be leveraged to create this hub.

The U.S. has significant funding capability, while all three (Japan, Australia and the U.S.) also possess advanced biotechnology innovation ecosystems and intellectual property. India has skilled manpower and the potential to provide

affordable scale.

Indeed, India is the ideal choice to host the biomanufacturing hub thanks to its existing infrastructure, pharmaceutical manufacturing expertise, and the available workforce.

According to the Australian Strategic Policy Institute, India is among the top performers in the field of biomanufacturing in both the quality of research output and in the share among research publications.

India also has significant potential in low-cost biomanufacturing, particularly in the production of enzymes, reagents, research materials, and equipment. According to at least one analysis, the cost of manufacturing in India is around 33% lower when compared to that in the U.S. However, India still requires significant capability and capacity uplifts to become a world leader.

India also has significant potential in low-cost biomanufacturing, particularly in the production of enzymes, reagents, research materials, and equipment.

### **What needs to be done?**

To scale up the biomanufacturing sector, India needs to uplift its workforce quality. While there are many life science professionals in the country, they lack access to cutting-edge technology and training.

To address this, permanent training facilities can be established in universities around the Quad hub, with experts from other Quad countries providing the training.

To facilitate cross-Quad collaboration, the biomanufacturing hub can house all current bilateral government efforts and establish a research collaboration office for this purpose.

The hub can also harmonise language, regulations, and data-sharing regarding biomanufacturing to secure supply chains for Quad nations and facilitate international collaboration. Such streamlining will boost collaboration efforts within the Quad and create opportunities for collaboration with nations outside the Quad as well.

The proposed hub in India can capitalise on the economic potential of the biomanufacturing industry and address existing and potential vulnerabilities in the global system. India can become a leading player in the field of biomanufacturing and help the Quad to compete in this key area.

# U.S. DIGITAL TRADE WITH INDIA

*GS-II Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.*

## Context

During Prime Minister Narendra Modi's U.S. state visit, cooperation on technology emerged as a prominent talking point and yielded some of the most substantive outcomes. However, digital trade is also the area where some of the biggest U.S. tech companies have recently flagged multiple policy hurdles, including "India's patently protectionist posture". Earlier this year, the Washington D.C.-headquartered Computer & Communications Industry Association (CCIA), with members like Amazon, Google, Meta, Intel, and Yahoo, flagged 20 policy barriers to trading with India in a note titled "Key threats to digital trade 2023".

## Current Status of India-US Technology Trade

In FY2023, the US became India's largest trading partner, with bilateral trade reaching \$128.55 billion. However, digital or technology services have not played a prominent role in this trade.

The US has a significant trade deficit of \$27 billion in digital services with India, despite the potential for growth in the US digital services export sector and the expanding online services market in India.

## Concerns of US Tech Firms

US tech companies have raised concerns about the "significant imbalance" and "misalignment" in the US-India economic relationship. They argue that India's policies favor domestic players, creating a tilted playing field.

US tech firms criticize India's regulations, such as geospatial data sharing guidelines, for providing preferential treatment to Indian companies. They also express discontent over India's departure from democratic norms, leading to challenges for US companies operating in India.

## Policy Barriers Raised by US Tech Firms

**Equalisation Levy:** US tech firms object to India's expanded version of the equalisation levy, which imposes taxes on digital services. They argue that it leads to double taxation, complicates the tax framework, and raises questions of constitutional validity and compliance with international obligations.

**Information Technology Rules:** US tech firms are concerned about India's Information Technology Rules, which impose compliance burdens and tight deadlines for content takedown, appointment of local

compliance officers, and the establishment of Grievance Appellate Committees.

**Data Protection Law:** Ambiguities surrounding cross-border data flows, compliance timelines, and data localization in India's draft Digital Personal Data Protection Bill raise concerns among US tech firms. They argue that data localization requirements increase operating costs and can be seen as discriminatory.

## What is Data Localization?

*The importance and use of data in today's technology-driven world is immense. Countries mandate data that are created within their borders to remain stored within their territorial boundaries. This process of storing data locally is referred to as data localisation.*

For instance, India, with more than 759 million active internet users representing more than 50% of its population is a gold mine for data. The country is also planning to become a hub for data processing, wanting to host data centres and cloud service providers. This means that India's policy on the flow of data across borders will impact the same on a global level, as was seen with the European Union's landmark General Data Protection Regulation (GDPR).

Foreign tech companies

like Meta or Amazon operating in India find it convenient to store their data, say in the U.S. or wherever they have their servers. This means that such data has to leave Indian borders. The new draft has only one line about cross-border data flows — Section 17 of the Act says that cross-border flow of data will only be allowed for a list of countries notified by the Centre.

On what basis will these countries be notified and what will the terms for such transfers be is not mentioned in the draft. Industry experts wonder whether whitelisting some countries for allowing data transfers would mean that other countries are automatically blacklisted.

The CCIA argues that

instead of taking this “opaque” approach, the law could be strengthened by “proactively supporting cross-border data flows through certifications, standard contractual clauses and binding corporate rules”.

### Other Policy Barriers to Digital Trade

**Digital Competition Act:** The proposed adoption of a Digital Competition Act, including estimated taxes for big tech companies, has raised concerns about anti-competitive practices and potential targeting of US tech firms.

**Competition Commission Fines:** The fines imposed by the Competition Commission of India on Google for anti-competitive practices

have been seen by US tech firms as part of India’s protectionist industrial policy.

### Conclusion

The following actions can be implemented to encourage digital trade between India and the United States and remove regulatory obstacles:

- Transparent and Reliable Rules
- Regulations Review and Improvement
- Agreements Regarding Mutual Recognition
- Frameworks for Data Sharing
- interdisciplinary research and development
- Internet security collaboration

## INDO-PACIFIC ECONOMIC FRAMEWORK FOR PROSPERITY

*GS-II Bilateral, regional and global groupings and agreements involving India and/or affecting India’s interests.*

### Why in News?

India agreed to be a part of the Indo-Pacific Economic Framework for Prosperity (IPEF), a U.S.-led economic grouping comprising 12 countries.

These include Australia, Brunei, India, Indonesia, Japan, South Korea, Malaysia, New Zealand, the Philippines, Singapore, Thailand and Vietnam. Together, these countries account for 40 per cent of the global GDP.

### What is Indo-Pacific

### Economic Framework

It is an economic initiative launched by the US President Joe Biden on May 23, 2022. The framework launched with a total of 14 participating founding member nations in the Indo-Pacific region with an open invitation for other countries to join.

The IPEF members represent 40% of the global GDP and 28% of the world’s trade. Analysts have compared it to the Trans-Pacific Partnership (TPP), which the US withdrew from in 2017.

### Four Pillars

The economic framework broadly rests on four pillars: **trade, supply chain resilience, clean energy and decarbonisation, and taxes and anti-corruption measures.**

The U.S. Trade Representative (USTR) will be spearheading the trade pillar, while the others (i.e., supply chain resilience, clean energy and decarbonisation, and taxes and anti-corruption measures) will fall under the purview of the U.S. Department of Commerce.

On **the trade** front, the endeavour is to establish “high-standard, inclusive, free, and fair-trade commitments” to fuel economic activity and investments benefitting both workers and consumers.

**Digital trade** incorporates not just the purchase and sale of goods online but also data flows that enable the operation of global value chains and services, like smart manufacturing, platforms and applications. The idea here is to overcome downstream costs for businesses as well as upscale the ability to utilise data processing and analysis, and enhance cybersecurity outside their geographies.

As for **supply chain resilience**, the framework aspires to secure access to key raw and processed materials, semiconductors, critical minerals and clean energy tech, particularly for crisis response measures and ensuring business continuity.

**In line with the Paris Agreement, the clean energy, decarbonisation and infrastructure pillar** would provide technical assistance and help mobilise finance, including concessional finance,

to improve competitiveness and enhance connectivity by supporting countries in the development of sustainable and durable infrastructure for adopting renewable energy.

Renewable energy is cheaper than fossil fuels, however, its high start-up costs when compared to using existing infrastructure stave off its adoption by the mainstream. Public policy analysts at the Centre for Strategic and International Studies (CSIS) suggest that regional partners would like the U.S. to help close the gap through climate financing and expertise sharing.

Lastly, **the pillar on tax and anti-corruption** is aimed at promoting fair competition by enforcing robust tax, anti-money laundering and anti-bribery regimes in line with existing multilateral obligations, standards and agreements to curb tax evasion and corruption in the region.

### How do members participate?

Countries are free to join (or not join) initiatives under any of the stipulated pillars but are expected to adhere to all commitments once they enrol. Negotiations slated to

begin after the launch are meant to determine and list the provisions under each pillar and open the floor for countries to choose their ‘commitments’.

Additionally, the framework would be open to other countries willing to join in the future provided they are willing to adhere to the stipulated goals and other necessary obligations.

### Way Forward

It is essential for India to approach the decision on joining the IPEF with a long-term perspective, taking into account its national interests, economic priorities, and the potential impact on various sectors.

India will be able to make decisions maximising the benefits and minimising risks for its economy and society if a well informed and strategic approach is adopted, based on the following factors: comprehensive assessment, Prioritize national interests, active engagement in negotiations, strengthening domestic industries, diversification of trade partnerships, internal policy reform.





# SOCIAL JUSTICE

What's Inside?

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# NATIONAL SICKLE CELL ANAEMIA ELIMINATION MISSION

## Context:

The PM will launch (today) the 'National Sickle Cell Elimination Mission' today with the target to eradicate the disease by 2047.

## From where?

The mission announced in the Union Budget 2023 will be launched from a public programme in Shahdol in Madhya Pradesh.

MP is a state with the highest tribal population in terms of absolute numbers as per Census 2011 and also has the highest burden of sickle cell anaemia.

## Background:

Sickle cell disease is a genetic blood disease which affects the whole life of an affected patient.

It is more common in the tribal population of India but occurs in non-tribals too.

It not only causes anaemia but also pain crises, reduced growth, and affects many organs like lungs, heart, kidneys, eyes, bones and the brain.

## How vulnerable India is?

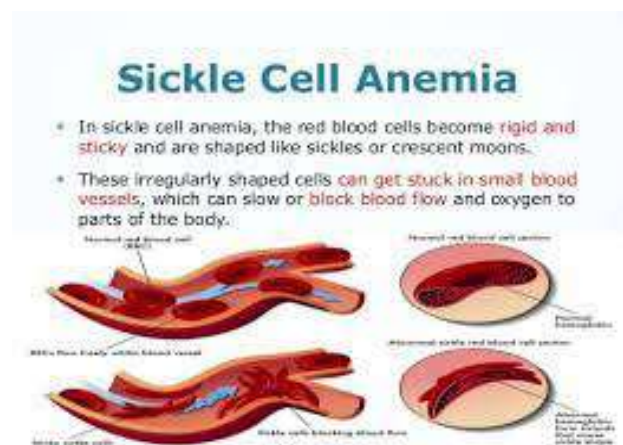
Globally, India has the largest density of tribal population [Census 2011: Tribal population - 8.6% of the total population of India/ 67.8 million].

Sickle cell disease is one of the 10 special problems in tribal health that affect the tribal people disproportionately, thus making intervention necessary.

## National Sickle Cell Anaemia Elimination Mission:

**Mission:** To improve the care of all Sickle Cell Disease patients for their better future and to lower the prevalence of the disease through a multi-faced coordinated approach towards screening and awareness strategies.

**Vision:** Eliminate sickle cell disease as a public health problem in India by 2047.



# INDIA'S RETHINKING OF POLICY SHIFT ON ANAEMIA ESTIMATES

## Why in news:

Inaccuracy of anaemic estimates from NFHS report has made India to think of revising its estimate process for clear picture.

## What is anaemia?

According to the World Health Organization (WHO), anaemia is a condition in which the number of red blood cells or the haemoglobin concentration within them is lower than normal.

Haemoglobin is needed to carry oxygen and if there are too few red blood cells, or not enough haemoglobin, there will be a decreased capacity of the blood to carry oxygen to the body's tissues, resulting in symptoms such as fatigue, weakness, dizziness and shortness of breath among others.

Anaemia, according to WHO, may be caused by several factors.

The most common nutritional cause of anaemia is iron deficiency although deficiencies

in folate, vitamins B12 and A are also important causes.

According to the Health Ministry, assessment of anaemia in India is being shifted to the new Diet and Biomarkers Survey in India (DABS-I), launched last year to map diet, nutrition and health status and provide the correct estimate of anaemia among the rural and urban population.

### The story so far:

Questions related to anaemia are slated to be dropped from the National Family Health Survey (NFHS-6). The omission comes after health experts questioned the efficacy of the method being used to estimate haemoglobin levels. India's anaemia burden has grown alarmingly with NFHS-5 (2019-21) finding that 57% of women in the age group 15-49 and 67% children between six months and 59 months are anaemic (from the corresponding 53% and 58.6% respectively in NFHS-4 (2015-16)). The Health Ministry has noted that anaemia is a public health challenge and accurate estimates are needed to tackle the crisis.

### Will a dietary survey help?

The Health Ministry says DABS-I is a comprehensive national-level dietary survey, which will define food and nutrient adequacy by collecting individual dietary intake data of

different age-groups of people from all States and UTs across the country.

The study will also provide nutrient composition data on cooked and uncooked foods from various regions of the country for the first time.

On the other hand, NHFS provides information on population, health, and nutrition for India and each State/UT.

Besides providing evidence for the effectiveness of ongoing programmes, the data from NFHS helps in identifying the need for new programmes with an area specific focus.

### Why the focus on anaemia?

Data on anaemia remains an important indicator of public health since anaemia is related to morbidity and mortality in the population groups usually considered to be the most vulnerable pregnant women and children under five.

A prevalence study on anaemia is useful to monitor the progress of reproductive health.

Also, iron-deficiency anaemia reduces the work capacity of individuals and entire populations, with serious consequences for the economy and national development.

## WORLD DRUG REPORT 2023

### Why in news?

The United Nations Office on Drugs and Crime (UNODC) recently released the World Drug Report 2023, shedding light on the escalating issue of drug use and the insufficiency of treatment services and interventions. The report highlights the increasing number of people who inject drugs, surpassing previous estimates, and emphasizes the pressing need for action amidst intersecting global crises.

### Key findings of the report

**Increased Number of People Who Inject Drugs:** The report reveals that the global estimate of people who inject drugs in 2021 is 13.2 million, which is 18 percent higher than previously

estimated. This significant increase highlights the growing prevalence of drug injection and the need for targeted interventions.

**Escalation in Global Drug Use:** The report indicates that over 296 million people used drugs in 2021, representing a 23 percent increase compared to the previous decade. This alarming rise in drug use calls for comprehensive measures to address the root causes and consequences of substance abuse.

**Surge in Drug Use Disorders:** The number of individuals suffering from drug use disorders has skyrocketed, reaching 39.5 million, a staggering 45 percent increase over the past ten years. This finding underscores the urgent need for accessible

and effective treatment services to support those grappling with drug-related disorders.

**Impact of Drug Trafficking on the Environment and Crime:** The analysis highlights that drug trafficking not only poses health risks but also accelerates environmental devastation and crime, particularly in the Amazon Basin.

**Treatment Disparities and Access Inequality:** Access to treatment for drug use disorders remains highly unequal, with fewer than 20 percent of people receiving the necessary care. The report highlights the disparity in treatment access, particularly for women using amphetamine-type stimulants, with only 27 percent receiving treatment. Addressing these inequalities is crucial for providing equitable support to all individuals in need.

**Vulnerability of Youth:** The report underscores the vulnerability of youth populations to drug use and substance use disorders in various regions. In Africa, 70 percent of individuals in treatment are under the age of 35.

## Drug trafficking in India

India is strategically located between the Golden Crescent (Afghanistan, Iran, and Pakistan) and the Golden Triangle (Myanmar, Thailand, Laos, and Vietnam), two major drug-producing regions in the world. This proximity makes India susceptible to the flow of drugs from these regions.

Drug traffickers continually adapt to law enforcement measures by employing innovative techniques. The use of drones for drug and weapon supply, particularly in border areas like Punjab, has emerged as a new phenomenon in drug trafficking. India has seen an increase in the involvement of international drug cartels, particularly South American cartels controlling the cocaine trade. These cartels often have connections with local drug lords, gangsters, and Non-Resident Indians (NRIs) based in various countries.

Drug trafficking networks have been found to have connections with terrorist organizations such as Lashkar-e-Toiba and Hizbul Mujahideen. The illicit money generated from the narcotics trade is often used to finance terrorism and fund

other disruptive activities. The proliferation of darknet markets has disrupted traditional drug markets, making it more challenging to track and intercept drug shipments. Studies have indicated that a significant portion of the darknet is utilized for illicit drug trafficking.

## Steps taken by India to address the issue of drug trafficking

**National Policy on Narcotic Drugs and Psychotropic Substances:** India has a comprehensive policy framework to address the issue of narcotics trade. The National Policy on Narcotic Drugs and Psychotropic Substances provides a framework for controlling the illicit traffic in drugs, preventing drug abuse, and providing care and rehabilitation to drug addicts.

**Narcotics Control Bureau:** The Narcotics Control Bureau (NCB) is the nodal agency for combating drug trafficking in India. It works closely with other law enforcement agencies to prevent drug trafficking, intercept drug shipments, and prosecute drug traffickers.

The 'Nasha Mukh Bharat', or Drug-Free India Campaign which focuses on community outreach programs.

**National Action Plan for Drug Demand Reduction (NAPDDR)** is an umbrella scheme of the Ministry of Social Justice & Empowerment (MoSJ&E) under which financial assistance is provided to State Governments/ Union Territory (UT) Administrations for Preventive Education and Awareness Generation.

**International cooperation:** India has been cooperating with other countries to combat the narcotics trade. It has signed several bilateral and multilateral agreements to strengthen cooperation on drug trafficking, including the SAARC Convention on Narcotic Drugs and Psychotropic Substances and the UN Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances.

**Strengthening border security:** India has been strengthening its border security to prevent the entry of drugs into the country. The government has been using modern technology, such as drones

and sensors, to monitor the borders.

### Recommendations:

The report calls for increased monitoring of public health impacts as regulatory changes and

clinical trials involving psychedelics progress. Prioritizing public health, prevention, and access to treatment services worldwide to ensure that drug challenges do not leave more people behind

## STATE FOOD SAFETY INDEX

### Context:

Food Safety and Standards Authority of India (FSSAI)'s 4th State Food Safety Index (SFSI) was released on the occasion of World Food Safety Day (June 7).

It seeks to measure the performance of States across five parameters of food safety.

### What is the State Food Safety Index (SFSI)?

The index was developed by FSSAI (Food Safety and Standards Authority of India) in 2018-19 to measure the performance of states on five significant parameters of Food Safety.

The parameters include Human Resources and Institutional Data, Compliance, Food Testing – Infrastructure and Surveillance, Training & Capacity Building and Consumer Empowerment.

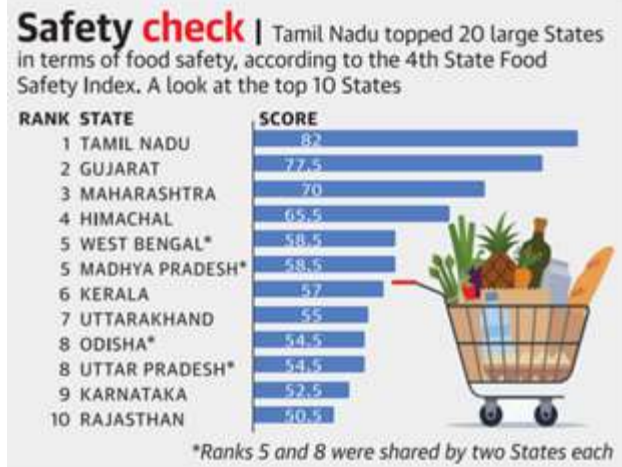
The index will help in providing safe and nutritious food to our citizens.

### Performance of various states:

**Tamil Nadu topped the State Food Safety Index followed by Gujarat and Maharashtra.**

Among Smaller States, Goa stood first, followed by Manipur and Sikkim.

Among UTs, Jammu and Kashmir, Delhi and Chandigarh secured first, second and third ranks.



### What is World food safety day?

The World Health Organization (WHO) and the Food and Agriculture Organization of the United Nations (FAO) jointly facilitate the observance of World Food Safety Day, in collaboration with Member States and other relevant organizations.

It was first celebrated in 2019.

Objective: To strengthen the commitment to scale up food safety made by the Addis Ababa Conference and the Geneva Forum in 2019 under the umbrella of "The Future of Food Safety".

The theme for 2022 was Safer Food, Better Health.

# GENDER SOCIAL NORMS INDEX 2023

## Context:

The UNDP's Gender Social Norms Index (GSNI) 2023 has revealed no improvement in biases against women in a decade, with almost 9 out of 10 men and women worldwide still holding such biases.

## What is the GSNI?

First introduced in the 2019 Human Development Report, GSNI provides an in-depth account of the root causes of gender inequality that hinder progress for women and girls.

It covers 4 key dimensions – political, educational, economic and physical integrity – to highlight areas where women and girls face systematic disadvantages and discrimination.

## Highlights of the GSNI 2023:

Half of people worldwide still believe men make better political leaders than women.

**Over 40% believe men make better business executives than women.**

A staggering 25% of people believe it is justified for a man to beat his wife.

The share of women as heads of state or heads of government has remained around 10% since 1995.

In the labour market, **women occupy less than a third of managerial positions.**

A broken link between women's progress in education and economic empowerment.

For example, women are more skilled and educated than ever before, yet the average gender income gap remains a staggering 39% in favour of men.

## Impact of these biases:

Drive hurdles faced by women manifested in a dismantling of women's rights, and a surge of human rights violations.

As a result, movements against gender equality are gaining traction in many parts of the world.

Severe underrepresentation of women in leadership.

## Way ahead:

Governments have a crucial role in shifting gender social norms. For instance,

Parental leave policies have changed perceptions around care work responsibilities, and

Labour market reforms led to a change in beliefs around the employment of women.

Directly addressing social norms through education to change people's views and more representation of women in decision-making and political processes.

An important place to start is recognising the economic value of unpaid care work, as women spend over six times as much time as men on unpaid care work.

The focus needs to be on expanding human development.

Investment in laws and policy measures that promote women's equality in political participation.

Insurance such as strengthening social protection and care systems.

Innovation, for example, combating online hate speech and gender disinformation can help to shift pervasive gender norms towards greater acceptance and equality.

# STRAY DOG MENACE IN INDIA

## *GS-II Government policies and interventions for development in various sectors*

Over the past few decades, the growing population of street dogs has posed increasing challenges for municipalities and cities across the country.

In this context, the Prevention of Cruelty (Animal Birth Control) Rules 2023 which has been designed to address emerging challenges gains importance.

### **Stray Dog Population in India**

India has one of the largest stray dog populations in the world. Estimates suggest that there are tens of millions of stray dogs in the country.

Stray dogs are often associated with rabies cases in India which is a significant public health concern. It is estimated that India accounts for a large portion of the global rabies burden.

Instances of dog bites and attacks, sometimes resulting in fatalities, have led to public outcry and calls for effective management strategies.

### **Importance of stray dogs**

If there is a vacuum created by the killings of dogs, it will be occupied by a more inconvenient species, such as rats, mice, mongoose and cockroaches.

The London Plague of 1665 was a result of the killing of 2,50,000 dogs and cats. The

mice population grew, and 70% of the human population was wiped out.

A similar incident happened in Surat in the near past, when a plague scare was spread as a result of removing dogs.

### **Reasons behind growing intolerance towards stray dogs**

**Resident Welfare Associations:** They are often the instigators of violence.

**Animal instincts:** Dogs get aggressive when they perceive a threat, forcibly relocated, or have witnessed abuse and neglect.

**Fascination for foreign breeds:** It is responsible for bad treatment of native breeds. Business of Pet shops thrive due to it.

### **Animal Birth Control Initiatives**

Historically, India has faced challenges in implementing effective animal birth control (ABC) programs. Inconsistent implementation, inadequate resources, and a lack of standardized processes have hindered the success of sterilization campaigns.

In 2001, the Animal Birth Control (Dogs) Rules were introduced in India (recommended by the WHO & World Organisation for

Animal Health) to guide the implementation of sterilization and vaccination programs for stray dogs. However, necessary measures have not been implemented by local authorities to manage the street dog population.

Animal Birth Control Rules, 2023 requires stray dogs to be caught, vaccinated, neutered, and released back. This approach aims to control the dog population without cruelty. The Rules provide guidelines on resolving human-dog conflicts without relocation of the animals.

The importance of people who look after native dogs on the streets has been recognised by our courts. In the new ABC Rules, community dog caregivers have been granted protection from harassment.

### **Issues with Animal Birth Control Rules 2023**

It aims to transform “stray dogs” into “community animals,” but this classification is unclear.

The Rules ask residents’ welfare associations to care for and feed the dogs away from children and the elderly, which could lead to more homelessness and susceptibility to disease and injury.

The Rules do not address improper disposal of solid waste and casual feeding of

dogs, which could lead to more conflicts between humans and dogs.

The local authorities will be responsible for any violation during birth-control procedures and animal-human conflicts, but they lack funds, staff, and infrastructure for this.

The lack of budget and infrastructure, the prevalence of corrupt and inefficient practices, and the absence of transparency and monitoring are the challenges in implementation.

## Way Forward

The effective strategy would be the implementation of the new ABC (Animal Birth Control) Rules of 2023.

A proactive approach to encourage the adoption of Indian dogs. If one person out of every 100 people adopts a dog from the street, there would be no dogs on the roads.

The native breeds of dogs should be promoted as they have better immune systems and make great pets.

Sterilisation of dogs is also suggested by the authorities in order to establish control over their enormous population rise.

A long-term solution is to implement strict pet ownership laws, prohibit people from carelessly feeding dogs everywhere, and set up facilities funded by animal welfare organisations that can either house dogs for life, or humanely euthanise them so they don't suffer on the streets.

# MODERN SLAVERY

*GS-I Social empowerment, GS-II Significant Provisions of Constitution*

## Modern Slavery

Modern slavery refers to the severe exploitation of individuals who are forced, coerced, or deceived into various forms of labor or servitude against their will. It encompasses a range of abusive practices that deprive people of their freedom, dignity, and basic human rights.

## Forms of modern slavery:

- Forced labor
- Debt bondage
- Human trafficking
- Child labor
- Forced marriage
- Sexual exploitation
- Exploitative working conditions
- Coercion

- Physical violence
- Restriction of freedom
- Inadequate pay or no pay
- Bonded labor
- Denial of education
- Forced prostitution
- Sexual abuse
- Commercial sexual exploitation



- Recruitment fraud
- Cross-border movement
- Hazardous conditions
- Child exploitation



## Drivers of Modern Slavery

Poverty and inequality

- Lack of education
- Migration and displacement
- Weak legal frameworks and enforcement
- Corruption
- Discrimination and marginalization
- Global demand for cheap labor
- Global demand for cheap goods
- Informal economy
- Lack of awareness and information
- Armed conflict and instability
- Environmental degradation and climate change
- Debt and economic bondage
- Lack of social protections
- Cultural and social norms
- Gender inequality and discrimination
- Lack of access to justice and remedies
- Supply chain complexity
- Human trafficking networks
- Exploitative recruitment practices

## Global Slavery Index 2023

The index presents a global picture of modern slavery. It

is constructed by Walk Free, a human rights organisation and is based on data provided by the Global Estimates of Modern Slavery, which, in turn, is produced by International Labour Organization (ILO), Walk Free, and International Organization for Migration (IOM).

This is the fifth edition of the Global Slavery Index and is based on the 2022 estimates.

However, the initial estimates are regional and to arrive at country-wise estimates, the index uses several representative surveys.

### Country-wise findings

There are three sets of key findings.

The first looks at the prevalence of modern slavery. The prevalence refers to the incidence of modern slavery per 1000 population.

On this count, the following 10 countries are the worst offenders:

1. North Korea
2. Eritrea
3. Mauritania
4. Saudi Arabia
5. Turkey
6. Tajikistan
7. United Arab Emirates
8. Russia
9. Afghanistan
10. Kuwait

“These countries share some political, social, and economic characteristics, including limited

protections for civil liberties and human rights,” states the index.

However, apart from prevalence, the index also calculates the countries hosting the maximum number of people living in modern slavery. Here the list is as follows:

1. India
2. China
3. North Korea
4. Pakistan
5. Russia
6. Indonesia
7. Nigeria
8. Turkey
9. Bangladesh
10. United States

Conditions that are contributing to the rise in slavery include environmental degradation, climate-induced migration, a roll-back of women’s rights and the pandemic

### State Imposed Forced labour

*State-imposed forced labour takes place when national or local authorities force citizens to work, where people have not offered themselves voluntarily.*

In 2021, an estimated 3.9 million people were forced to work by state authorities.

It is among the most egregious forms of modern slavery as it involves states not only failing in their duty to safeguard human rights, but actively using their power to perpetrate abuse.

State-imposed forced labour can be categorised into three

major types: *abuse of compulsory prison labour, abuse of conscription, and forced labour for economic development.* Abuse of compulsory prison labour accounts for over half (56 percent) of all state-imposed forced labour.

*Conscription is the state-mandated enlistment of people in a national service, mainly a military service.* Conscription constitutes state-imposed forced labour where conscripts are forced to perform work of a non-military nature. Abuse of conscription is evident in Egypt, Eritrea, Mali, and Mongolia.

## **Kafala System - a form of modern slavery**

Variations of the kafala system exist in Jordan, Lebanon, and the GCC countries — Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE. Collectively, the Arab States region is home to more than 24 million migrant workers, comprising over 40 per cent of the labour force — the highest share of any region.

*The kafala system is a set of laws and policies that delegate responsibility for migrant workers to employers, including control over their ability to enter, reside, work, and, in some cases, exit the host country.*

Workers typically cannot leave or change jobs prior to completion of their contract, before a certain time period, or without permission from their employer. Those who do leave may run the risk of arrest and deportation for the crime of absconding.

The system also limits the ability of exploited workers to access justice. In practice, a worker who leaves their job not only risks losing their means of earning an income, but also risks becoming an illegal migrant. This threatens their ability to pursue legal action against their employer and recover any income they are owed. If deported, workers may also face bans on returning to the country to work.

Some employers reportedly create additional barriers to justice; for example, by levelling false allegations of theft against migrant workers in retaliation for leaving

or filing false absconding reports with law enforcement to avoid paying wages owed.

Migrant workers can be deported even where no evidence exists to support the accusations, while employers enjoy impunity.

Female migrant domestic workers face specific challenges under the kafala system. Globally, patriarchal norms that *devalue domestic labour as “women’s work” confine women within the household and make them less visible to authorities.*

In high-income countries, domestic work is typically performed by low-paid female migrants who fill gaps in care driven by the curtailment of social welfare. These workers are subject to constant surveillance and face higher risks of gender-based violence, discrimination, and exploitation within their employer’s households. With their movements heavily

restricted, it is even more difficult for victims to leave situations of abuse.

## **Climate change - the aggravator**

Compounding crises serve to heighten the risks of all forms of modern slavery. The COVID-19 pandemic, armed conflicts, and climate change have led to unprecedented disruption in employment and education, as well as increases in inequalities, distress migration, and reports of gender-based violence and forced marriage.

Climate change intersects with modern slavery in multiple ways.

The impact of climate change hits hardest those who are already in precarious situations, such as women, children, indigenous people, and members of marginalised communities, increasing their vulnerability to modern slavery. Its effects may push *people to migrate and magnify drivers of displacement such as loss of livelihoods*, food insecurity, and a lack of access to water and other natural resources.

Migration in these contexts can be unplanned, with people lacking the resources they need to move safely. The greater precariousness that is generated out of these situations exposes populations to higher risks of modern slavery.

Modern slavery is also linked to *environmentally degrading industries* with high climate change impacts. Forced labour is pervasive in key industries that are driving

deforestation around the world.

Conversely, there is increasing evidence that renewable industries vital to our urgent transition to clean energy are also reliant on forced labour for the mining, processing, and manufacturing of critical minerals and inputs.

Separately, other structural factors, such as conflict, persecution, or political instability, can combine with climate change and other drivers to push people to migrate in situations of precariousness and make them more vulnerable to modern slavery.

## **Conflict and Modern Slavery**

Conflict and modern slavery are two interconnected issues that often occur together and exacerbate one another. While they are distinct problems, they often coexist in regions affected by armed conflict, where various forms of exploitation, including modern slavery, become prevalent.

Conflict can create conditions that facilitate the emergence and persistence of modern slavery. In situations of war, social and economic systems break down, leading to instability, displacement, and a breakdown of law and order.

Armed groups, militias, and other actors take advantage of this chaos to exploit vulnerable individuals, subjecting them to forced labor, sexual exploitation, child soldier recruitment, and other forms of slavery. These groups often use forced labor to sustain themselves economically,

as they control resources such as minerals, drugs, or agriculture.

Additionally, conflict-induced displacement exposes people to a higher risk of becoming victims of modern slavery. Displaced populations often lack access to basic services, livelihood opportunities, and protection, making them susceptible to exploitation by traffickers or unscrupulous employers.

On the other hand, modern slavery can also contribute to the onset and perpetuation of conflicts. Exploitative practices, such as forced labor or human trafficking, generate significant profits that can finance armed groups or support their operations.

In conflict zones, armed groups may use forced labor to extract natural resources or engage in other illicit activities to fund their military activities. These revenues from modern slavery can fuel conflict, prolonging suffering and instability in affected regions.

## **Social Media as a Facilitator of modern slavery**

While social media has enabled unprecedented levels of global connectivity and delivered many socio-economic benefits, greater connectivity has also brought new risks, with consequences that transcend the digital world.

There is mounting evidence social media is used to facilitate modern slavery, with perpetrators able to simultaneously target multiple

people in different geographic locations, access their personal information, and exploit vulnerabilities while shielded by online anonymity.

At the same time, rapid technological advancements have outpaced the development of regulatory frameworks, resulting in a lack of effective governance and accountability that enables modern slavery risks to flourish online.

The facilitation of forced commercial sexual exploitation (FCSE) of adults and children using social media is well documented.

Social media users may be recruited through deceptive job advertisements or targeted outreach using chat features, typically under the guise of building a relationship.

In June 2021, for example, 11 people were arrested for trafficking women and girls from Bangladesh to India for sexual exploitation after luring them via TikTok with the promise of work.

Following recruitment, social media may be used to track victims' locations, control their movements, and to record, advertise, and distribute FCSE material.

In 2023, shareholders launched litigation against Meta, arguing that the company's leadership and board failed to protect shareholder interests by purportedly turning "a blind eye" to widespread evidence of sex trafficking and child sexual exploitation on Facebook and Instagram

Increasing use of social media to search for employment and the growing perception of it as a reliable source of information has created new opportunities for exploitation.

Fraudulent recruiters and traffickers may target potential victims via social media business pages, recruitment advertisements, and direct outreach on social media platforms.

## Measures of India against Modern slavery

**Legislation:** India has enacted laws such as the Bonded Labour System (Abolition) Act of 1976, which prohibits bonded and forced labor. The Act has been amended to expand its scope to include contract and migrant workers.

**Rehabilitation schemes:** India has a Central scheme for Rehabilitation of Bonded Labour, which provides financial assistance and support to rescued individuals.

**Legal protections:** The Supreme Court of India has ruled that non-payment of minimum wages amounts to forced labor under Article 23 of the Constitution.

Tamil Nadu have initiated plans to conduct a survey to property identify and enumerate people stuck in modern slavery conditions; India's last national survey of bonded labour was done in mid-90s.

## International Frameworks

International Labour Organization (ILO) Forced Labour Conventions:

ILO Convention No. 29: Forced Labour Convention, 1930

ILO Convention No. 105: Abolition of Forced Labour Convention, 1957

These conventions set out the fundamental principles and rights related to forced labor, emphasizing the need for its eradication and providing guidelines for member states to take appropriate measures to prevent and eliminate forced labor practices.

**United Nations Universal Declaration of Human Rights (UDHR):** The UDHR recognizes the right to freedom from slavery, servitude, and forced labor under Article 4, affirming that no one should be held in slavery or forced labor.

**United Nations Sustainable Development Goals (SDGs):** Goal 8.7 of the SDGs specifically addresses forced labor, aiming to “take immediate and effective measures to eradicate forced labor, end modern slavery and human trafficking, and secure the prohibition and elimination of the worst forms of child labor.”

Alliance 8.7: Alliance 8.7 is a global partnership focused on achieving SDG Target 8.7,

**United Nations Guiding Principles on Business and Human Rights:** The Guiding Principles emphasize the responsibility of businesses to respect human rights, including the obligation to prevent

and address any involvement in forced labor within their operations and supply chains.

## Recommendations for governments

Ensure survivor support services, including shelters, crisis support centres, and community-based protection, cover all populations — including males, adults, and migrants — and make specialised support available for children.

**Strengthen legislation to protect survivors** of exploitation by ensuring they are not treated as criminals for conduct that occurred while under the control of traffickers. Ensure legislation supports compensation and restitution for survivors of modern slavery and that this occurs in practice, including by setting up a compensation fund for survivors.

**Raise the minimum age of marriage to 18 for girls and boys with no exemptions.**

Extend labour laws to ensure that all groups are covered without exception and ensure that labour inspections are regularly conducted across all sectors, including the informal sector. Introduce and enforce laws to prohibit charging of recruitment fees to employees and register and monitor local recruitment agencies for deceptive practices, ensuring contracts are made available in a language migrants can understand.

**Introduce mandatory human rights due diligence** to stop governments and businesses sourcing goods or services linked

to modern slavery

Take decisive climate action to put a halt to the worsening of climate change and the negative effects it has on communities across the world. This includes making the necessary, science-based reductions in carbon emissions in accordance with internationally recognised timelines.

Design climate solutions with an intersectional and inclusive approach that takes into account human rights violations, including vulnerability to modern slavery.

Develop safer and more legal routes for migration, to increase protection from vulnerability to severe exploitation. This should include removing barriers that

prevent migrants from seeking the impacts of climate change. National policies should address the vulnerabilities to modern slavery of internal migrants, including by improving accessibility to social protection mechanisms.

# Economic Development & Agriculture



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## GREEN BONDS

### Context:

India is likely to face an uphill battle if it goes ahead with its first sovereign green bond sale as it aims to issue the securities in rupees, putting off most overseas investors.

### What's the issue?

The timing might not be ideal for India though, especially for a rupee issuance.

The currency has slumped more than 4% this year amid concern the Reserve Bank of India is behind the curve in tackling inflation, with elevated crude oil prices adding to pressures on the net importer.

### What Is a Green Bond?

A green bond is a type of fixed-income instrument that is specifically earmarked to raise money for climate and environmental projects.

These bonds are typically asset-linked and backed by the issuing entity's balance sheet, so they usually carry the same credit rating as their issuers' other debt obligations.

Green bonds may come with tax incentives to enhance their attractiveness to investors.

The World Bank is a major issuer of green bonds.

### How Does a Green Bond Work?

Green bonds work just like any other corporate or government bond.

Borrowers issue these securities in order to secure financing for projects that will have a positive environmental impact, such as ecosystem restoration or reducing pollution.

Investors who purchase these bonds can expect to make as the bond matures.

In addition, there are often tax benefits for investing in green bonds.

### Green Bonds Vs Blue Bonds:

Blue bonds are sustainability bonds to finance projects that protect the ocean and related ecosystems.

This can include projects to support sustainable fisheries, protection of coral reefs and other fragile ecosystems, or reducing pollution and acidification.

All blue bonds are green bonds, but not all green bonds are blue bonds.

### Green Bonds Vs Climate Bonds:

“Green bonds” and “climate bonds” are sometimes used interchangeably, but some authorities use the latter term specifically for projects focusing on reducing carbon emissions or alleviating the effects of climate change.

## RBI EXPANDS SCOPE OF TReDS

The Reserve Bank of India (RBI) has authorized insurance companies to operate in the trade receivable discounting system (TReDS) in a bid to solve low-rated buyers' payment challenges. TReDS facilitates various parties like sellers, buyers and financiers making it a preferred mode of financing for Micro Small and Medium Enterprises (MSMEs).

### Trade Receivables e-Discounting system (TReDS)

TReDS was launched in 2014 by the RBI,

to ease the cash flow problems of MSMEs and enhance their access to credit. Currently, three entities operate TReDS platforms, processing about Rs 60,000 crore worth of transactions annually.

Trade receivables discounting system (TReDS) is a digital platform that facilitates the financing of trade receivables of micro, small and medium enterprises (MSMEs) from corporate buyers through multiple financiers. TReDS enable MSMEs to access funds by selling their trade receivables at a competitive rate through an auction mechanism. TReDS also benefits corporate

buyers and financiers by providing them with an opportunity to improve their cash flow and portfolio diversification respectively.

TReDS is a payment system authorised under the Payment and Settlement Systems Act, 2007 (PSS Act). It is a platform for uploading, accepting, discounting, trading and settling invoices/bills of MSMEs and facilitating both receivables and payables factoring (reverse factoring). MSME sellers, corporate and other buyers, including Government Departments and PSUs, and financiers (banks, NBFC-Factors and other financial institutions, as permitted) are direct participants in the TReDS and all transactions processed under this system are “without recourse” to MSMEs.

## Benefits

For MSME suppliers, TReDS provides a quick and easy way to access funds without collateral and at a competitive rate. It also reduces the risk of default by corporate buyers and improves their credit rating.

For corporate buyers, TReDS helps them to optimize their working capital management by extending their payment cycle and availing discounts from suppliers. It also enhances their reputation and relationship with MSME suppliers.

For financiers, TReDS offers a new avenue for lending with low risk and high returns. It also enables them to diversify their portfolio and reach out to a large number of MSMEs.

## WORLD'S LARGEST GRAIN STORAGE PLAN

### Why in the News?

The Union Cabinet recently approved the constitution of an Inter-Ministerial Committee (IMC) to facilitate the “world’s largest grain storage plan in the cooperative sector”

### About

The Ministry of Cooperation has developed the grain storage plan to leverage the strength of cooperatives and transform them into successful business enterprises, aligning with the vision of “Sahakar-se-Samridhi” (Cooperation for Prosperity).

### Why does India need a grain storage plan?

India, the most populous country in the world, **accounts for 18 per cent (1.4 billion)** of the global population (7.9 billion).

However, **it accounts for only 11 per cent** (160 million hectare) of the arable land (1,380 million hectare) in the world.

Also, **India runs the world’s largest food programme** under the National Food Security Act, 2013, that covers about 81 crore people.

Therefore, to ensure food security of a billion

plus population, a robust network of foodgrain storage facilities becomes essential.

At present, India has a foodgrain storage capacity of 145 million metric tonnes (MMT) against the total food production of 311 MMT—leaving a gap of 166 MMT. In the absence of sufficient storage facilities, foodgrains are sometimes stored in the open, which results in damage.

India has a storage capacity of 47 per cent of its total foodgrains production. At the regional level, only a few southern states have the storage capacity of 90 per cent and above. In northern states like Uttar Pradesh and Bihar, it is below 50 per cent.

### Why Primary Agricultural Credit Societies (PACS)?

Presently, multiple government agencies, like the Food Corporation of India (FCI), Central Warehouse Corporation, Warehouse Development Regulatory Authority, Railways, and the civil supply departments of states are involved in grain management. However, that has not yielded the desired results.

Under the new plan, the Ministry of Cooperation aims to set up a network of



### Primary Agricultural Credit Societies (PACS)

Primary Agricultural Credit Societies (PACS) in India are cooperative credit institutions that play a crucial role in providing agricultural credit and other financial services to rural farmers. PACS are at the grassroots level and are typically formed at the village or mandal (block) level.

The main objective of PACS is to meet the short-term credit requirements of agricultural farmers in their operational activities, such as crop production, purchase of agricultural inputs, and working capital needs. These societies operate under the guidance and supervision of the state-level cooperative banks and the National Bank for Agriculture and Rural Development (NABARD).

PACS form an integral part of the agricultural credit structure in India, helping to improve rural credit availability and support the agricultural sector's growth and development.

integrated grain storage facilities through Primary Agricultural Credit Societies (PACS) across the country.

According to the ministry, there are more than 1,00,000 PACS spread across the country with a huge member base of more than 13 crore farmers. This is one of the reasons why the PACS network was chosen for the new plan.

In view of the important role played by PACS at the grass root level in transforming the agricultural and rural landscape of Indian economy and to leverage their deep reach up to the last mile, this initiative has been undertaken to set up decentralized storage capacity at the level of PACS along with other agri infrastructure, which would not only strengthen the food security of the country, but would also enable PACS to transform themselves into vibrant economic entities.

### Who is in the IMC?

Chairman - Amit Shah, Minister of Cooperation

**Members** :Narendra Singh Tomar, Minister of Agriculture and Farmers Welfare; Piyush Goyal, Minister of Consumer Affairs, Food and Public Distribution; Pashupati Kumar Paras, Minister of Food Processing Industries and Secretaries will be members of the committee.

### What is the budgetary allocation?

Though the plan does **not have a separate allocation**, it will be implemented by the convergence of 8 schemes. The Plan would be

implemented by utilizing the available outlays provided under the identified schemes of the respective Ministries. Following schemes have been identified for convergence under the Plan:

#### (a) Ministry of Agriculture and Farmers Welfare:

Agriculture Infrastructure Fund (AIF),Agricultural Marketing Infrastructure Scheme (AMI),Mission for Integrated Development of Horticulture (MIDH),Sub Mission on Agricultural Mechanization (SMAM)

#### (b) Ministry of Food Processing Industries:

Pradhan Mantri Formalization of Micro Food Processing Enterprises Scheme (PMFME),Pradhan Mantri Kisan Sampada Yojana (PMKSY)

#### (c) Ministry of Consumer Affairs, Food and Public Distribution:

Allocation of food grains under the National Food Security Act,Procurement operations at Minimum Support Price

### Benefits of the Plan

The plan is multi-pronged – it aims to address not just the shortage of agricultural storage infrastructure in the country by facilitating establishment of godowns at the level of PACS, but would also enable PACS to undertake various other activities, viz:

Functioning as Procurement centres for State Agencies/ Food Corporation of India (FCI);

- Serving as Fair Price Shops (FPS);
- Setting up custom hiring centers;
- Setting up common processing units, including assaying, sorting, grading units for agricultural produce, etc.

Further, creation of decentralized storage capacity at the local level would reduce food grain wastage and strengthening food security of the country.

By providing various options to the farmers, it would prevent distress sale of crops, thus

enabling the farmers to realise better prices for their produce.

It would hugely reduce the cost incurred in transportation of food grains to procurement centres and again transporting the stocks back from warehouses to FPS.

Through 'whole-of-Government' approach, the Plan would strengthen PACS by enabling them to diversify their business activities, thus enhancing the incomes of the farmer members as well.

## FINANCIAL SERVICES INSTITUTIONS BUREAU (FSIB)

### Why in the News?

The Financial Services Institution Bureau (FSIB), the agency that looks for chiefs of PSU banks and insurers, has selected new chiefs for General Insurance Corporation of India (GIC Re) and National Insurance Company (NIC).

### About FSIB

It's a government body set up under the Department of Financial Services.

It replaced the Bank Board's Bureau (BBB) which was declared an incompetent authority.

### Structure:

FSIB would be headed by a chairman, a central government nominee.

The board would comprise the Secretaries of the DFS, the chairman of IRDAI, and a deputy governor of the RBI.

Additionally, it will have three part-time members who are experts in banking and three more from the insurance sector.

### The Primary role of FSIB:

To identify manpower capabilities and ensure proper selection of talent for senior positions at financial institutions owned by the government.

It is entrusted with making recommendations for the appointment of full-time directors and non-executive chairman of state-run financial services institutions.

The final decision on the FSIB recommendation would be taken by the Appointments Committee of the Cabinet headed by the Prime Minister.

### Other Mandates of FSIB:

It would also issue guidelines for selecting general managers and directors of public sector general insurance companies.

It will also be involved in formulating and developing business strategies for state-run banks and help them in their fund-raising plans.

It would also monitor and assess the performance of public sector banks, government-owned financial institutions and insurance companies.

## NaBFID

### Why in the News?

The National Bank for Financing Infrastructure Development (NaBFID) expects to end FY24 with final loan sanctions of ₹1 lakh crore and disbursements of close to ₹60,000 crore, according to MD and CEO Rajkiran Rai.

### About

The development finance institution, which made its first loan disbursement in December

2022, has so far disbursed about ₹15,000 crore to projects mostly in the road and energy (primarily renewable energy and transmission projects) sectors.

### Genesis of NaBFID

According to the World Bank, India needs to invest about 8% of its GDP annually in infrastructure to sustain its growth rate and meet the aspirations of its citizens. However, the current level of investment is only about 4% of

GDP, leaving a huge financing gap of about \$1.5 trillion over the next decade.

India has a huge infrastructure gap that needs to be bridged to achieve its economic and social goals. According to the Economic Survey 2020-21, India needs to spend about \$1.4 trillion on infrastructure during 2019-25 to become a \$5 trillion economy by 2025.

However, the traditional sources of infrastructure financing, such as banks, non-banking financial companies (NBFCs), and public sector undertakings (PSUs), are constrained by various factors, such as asset-liability mismatch, regulatory norms, and fiscal constraints.

To address the challenge, the government has established a new development finance institution (DFI), namely the National Bank for Financing Infrastructure and Development (NaBFID), under an Act of Parliament in 2021.

### About NaBFID

NaBFID was established with a mandate to provide long-term non-recourse finance for infrastructure projects, develop the bond and derivatives markets for infrastructure financing, and catalyze private and foreign investment in the sector.

It has been set up as a corporate body with an authorized share capital of ₹1 lakh crore, of which ₹20,000 crores has been invested by the central government as equity and ₹5,000 crores as a grant.

### Functions of NaBFID

Extending loans and advances for infrastructure projects.

Taking over or refinancing such existing loans.

Attracting investment from private sector investors and institutional investors for infrastructure projects.

Organising and facilitating foreign participation in infrastructure projects.

Facilitating negotiations with various government authorities for dispute resolution in the field of infrastructure financing.

Providing consultancy services in infrastructure financing.

### Source of Funds

It may raise money in the form of loans or otherwise both in Indian rupees and foreign currencies, or secure money by the issue and sale of various financial instruments including bonds and debentures.

It may borrow money from the central government, Reserve Bank of India (RBI), scheduled commercial banks, mutual funds, and multilateral institutions such as the World Bank and Asian Development Bank.

Initially, the central government will own 100% shares of the institution which may subsequently be reduced up to 26%.

### Management of NaBFID

NaBFID will be governed by a Board of Directors. The Chairperson will be appointed by the central government in consultation with RBI.

A body constituted by the central government will recommend candidates for the post of the Managing Director and Deputy Managing Directors.

The Board will appoint independent directors based on the recommendation of an internal committee.

### Support from the Central Government

The central government will provide grants worth Rs. 5,000 crore to NaBFID by the end of the first financial year.

The government will also provide guarantee at a concessional rate of up to 0.1% for borrowing from multilateral institutions, sovereign wealth funds, and other foreign funds.

Costs towards insulation from fluctuations in foreign exchange (in connection with borrowing in foreign currency) may be reimbursed by the government in part or full.

Upon request by NaBFID, the government may guarantee the bonds, debentures, and loans issued by NaBFID.

## Prior Sanction For Investigation And Prosecution:

No investigation can be initiated against employees of NaBFID without the prior sanction of the central government in case of the

chairperson or other directors, and the managing director in case of other employees.

Courts will also require prior sanction for taking cognisance of offences in matters involving employees of NaBFID.

# MANIPUR INVOKES RBI'S RIOT PROVISIONS

## Why in the News?

Recently, the Manipur government has invoked the **Riot Provision of the Reserve Bank of India (RBI)** in response to a Grave Situation in the State marked by riots and violence.

## About

The Manipur government has declared that the whole State of Manipur has been affected by riots and violence, impacting the economic activities and livelihood of majority of the general public.

To provide relief to the affected people and businesses, the State government has invoked a rarely used Reserve Bank of India (RBI) provision pertaining to restructuring and rescheduling of loans. It provides relief to borrowers when economic activity comes to a halt and offers a moratorium on repayment of loans.

The guidelines have so far been mostly invoked in areas affected by natural calamities and not for a law and order situation in the recent past.

## About Reserve Bank of India (RBI) provision

### *RBI Directions 2018*

The Provisions are as per Chapter No. 7 of the "Reserve Bank of India (Relief Measures by Banks in Areas Affected by Natural Calamities) Directions, 2018." Whenever RBI advises the banks to extend rehabilitation assistance to the riot/disturbance affected persons, the aforesaid guidelines may broadly be followed by banks for the purpose.

The Provisions specifically addresses "Riots and Disturbances".

The rules specify several norms that must be followed for Restructuring the Loans, providing

fresh loans and other measures, including KYC norms.

According to the directions, **all the short-term loans**, except those overdue at the time of the occurrence of riots, will be eligible for restructuring.

## Applicability

The provisions of these Directions shall apply to every Scheduled Commercial Bank (including Small Finance Banks (SFBs) and excluding Regional Rural Banks (RRBs) licensed to operate in India by RBI.

## Crop Loans

In the case of crop loans, if the loss ranges between 33% and 50%, borrowers are eligible for a maximum repayment period of two years. If the crop loss exceeds 50%, the repayment period can be extended up to a maximum of five years. Additionally, all restructured loan accounts will have a moratorium period of at least one year.

## Long Term Agri Loan:

If the crop is damaged without harm to productive assets, banks can reschedule installment payments for the affected year and extend the loan period by one year. Additionally, banks have the option to postpone interest payments by borrowers. However, if productive assets are also damaged, a new loan may be required.

## Fresh loans

Banks will evaluate borrowers' credit needs, follow loan approval procedures, and may offer collateral-free consumption loans up to Rs 10,000 to existing borrowers without personal guarantees, even if the value of assets is lower than the loan amount.

## Relaxation in KYC Norms

For the people who have lost their documents due to the calamity of riots, the banks need to open new accounts for such people. This will

be applicable where the balance in the account does not exceed Rs 50,000. The total credit in the account should not exceed Rs 1,00,000

# HOW ARE NUTRIENTS IN MILLETS AFFECTED BY PROCESSING AND POLISHING?

## Context

The U.N. Food and Agriculture Organisation (FAO) has declared 2023 to be the 'International Year of Millets', giving these crops a shot in the arm even as countries worldwide are looking to them for their ability to grow in environmental conditions that the climate crisis is rendering more common. Millets are becoming more popular in India as well because of their low input requirements and high nutritional density, both of which are valuable for a country whose food security is expected to face significant challenges in the coming decades.

## What are millets?

Millets are fundamentally grasses. They are cultivated worldwide, but especially in the tropical parts of Africa and Asia, as cereal crops.

Some of the more common varieties include pearl millet (*Cenchrus americanus*), barnyard millet (*Echinochloa utilis*), finger millet (*Eleusine coracana*), and foxtail millet (*Setaria italica*).

According to the Agricultural and Processed Foods Development Authority, India is the world's largest producer of millets. In 2021-2022, the country accounted for 40.51% of the world's pearl millet production and 8.09% of sorghum. Within the country, pearl millet made up 60% of all the millet production, sorghum 27%, and ragi 11%.

Sorghum (*Sorghum bicolor*), adlay millet (*Coix lacryma-jobi*), and teff (*Eragrostis tef*) – among others – are some grasses that differ in some respects from the millets but are grouped together with them.

## Why are they sought after?

Millets have two broad features that render them attractive: their **nutritional value** being

comparable to that of the major extant food crops (and better on some counts) and the **ability of millet crops to reliably withstand harsh**, resource-poor conditions.

They are **drought-tolerant**, adapted to growing in warm weather, and **require low moisture** (axiomatically, they are particularly efficient consumers of water) and **loamy soil**.

They don't grow well in water-logged or extremely dry soil, such as might occur after heavy rainfall or particularly bad droughts, respectively.

Nonetheless, millets have the reliability upper hand over crops like rice and maize with more drought-like conditions expected in many parts of the world, including the newly realised prospect of 'flash droughts'.

## Are millets nutritious?

The nutritional content of millets includes carbohydrates, proteins, fibre, amino acids, and various minerals. Different millet varieties have different nutrient profiles. For example, pearl millet – one of the oldest cultivated varieties – has been found to have higher protein content than rice, maize, and sorghum, while being comparable to that of barley.

According to various studies, foxtail millet is rich in the amino acid lysine; finger millet has more crude fibre than wheat and rice; proso millet has a significant amount of the amino acids leucine, isoleucine, and methionine; and overall, millets have been found to be important sources of micronutrients and phytochemicals.

## How does processing affect the nutrients?

Processing and preparing millets for consumption can affect nutrients in three ways:

enhance them, suppress/remove them, and ignore them. In this context, ‘whole grain’ refers to the endosperm, germ, and bran (pericarp + aleurone) whereas ‘refined grain’ refers only to the endosperm.

The husk is removed from the grains because it is composed of cellulosic matter that the human body can’t digest. But at least one study has found that when this is done to pearl millets, their phytic acid and polyphenol contents drop. (On the other hand, a paper published in 2021 found that millet husk could be briquetted and used as household fuel, and potentially alleviate energy poverty in north Nigeria.)

The second common step is to **decorticate the grain**, i.e. remove any other outer covering and expose the seed. While studies have found that mechanical and hand-worked decortication didn’t have significantly different effects on the grain, they both removed crude and dietary fibre. But decortication also makes the grain more

edible and visually attractive – favourable factors in marketing in urban centres.

The typical next steps are milling, to grind the grains into flour, and sieving to remove large ‘impurities’, including bran. One 2012 study of finger millet found that whole-flour had a high content of “total polyphenols and flavonoids” – while sieving made the flour more digestible and its nutrients more accessible to the body but reduced nutrient content due to the loss of bran.

### What is the effect of polishing?

A frequent last step is polishing.

The longer the grains were milled, the more protein, fat, and fibre contents the process removed. A different 2012 study found that barnyard millet could be polished with a rice polisher for up to three minutes without significant nutrient loss. Polishing is the process whereby brown rice, for example, is changed to white rice by rubbing off the bran and the germ.

## EVERGREENING OF LOANS

### Why in News?

Reserve Bank of India (RBI) Governor Shaktikanta Das recently raised red flags over banks adopting innovative methods for evergreening of loans – covering up the real status of stressed loans of corporates – to project an artificial clean image in cahoots with corporates.

### What is Evergreening of loans?

Evergreening of loans refers to a practice where banks or lenders provide additional funds or take other measures to artificially sustain a loan that is not being repaid as scheduled.

It is a temporary solution used by banks to avoid classifying the loan as a non-performing asset (NPA) because such classification would require them to set aside more money for potential losses, which could affect their profitability.

If an account turns into a non-performing asset (NPA), banks are required to make higher provisions which will impact their profitability. A loan turns into a nonperforming asset, or NPA,

if the interest or instalment remains unpaid even after the due date — and remains unpaid for a period of more than 90 days.

So, to avoid classifying a loan as an NPA, banks adopt the evergreening of loans. In the past, many banks had indulged in dressing up bad loans and given additional funds to companies who didn’t have the capacity to repay.

### Methods used by banks for Evergreening of loans

Bringing two lenders together to evergreen each other’s loans.

Good borrowers are being persuaded to enter into structured deals with stressed borrowers.

# HIKE IN MSP FOR KHARIF CROPS

The Cabinet Committee on Economic Affairs (CCEA) has approved the hike in the Minimum Support Prices (MSP) for all mandated Kharif Crops for Marketing Season 2023-24.

The hike in MSP for Kharif Crops for Marketing Season 2023-24 is in accordance with the Union Budget 2018-19 announcement of fixing the MSP at a level of at least 1.5 times the All-India weighted average Cost of Production, intending to provide reasonably fair remuneration for the farmers and encouraging crop diversification.

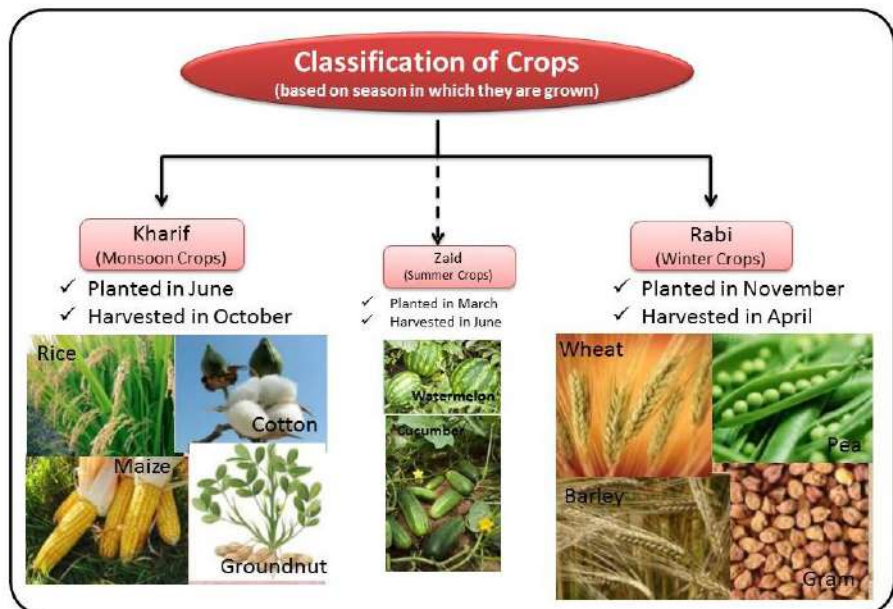
## About Minimum Support Price (MSP)

MSP is a form of market intervention (a policy decision not enforceable by law) by the Government of India to insure agricultural producers against any sharp fall in farm prices during bumper production years.

Basically, MSPs are support prices announced by the government (and sometimes state governments add a bonus amount to them).

The first MSP announcement was made in 1967. Later, the government set up the Agricultural Prices Commission (renamed as the Commission for Agricultural Costs and Prices in 1985) for fixing MSP for crops.

MSP is announced by the Cabinet Committee on Economic Affairs (Chaired by the Prime Minister of India) on the basis of the recommendations of the CACP at the beginning of the sowing season for certain crops.



Crops Covered: Government announces MSPs for 22 mandated crops and fair and remunerative price (FRP) for sugarcane (total 23).

The mandated crops are 14 crops of the kharif (summer sowing) season, 6 rabi crops (Wheat, Barley, Gram, Masur (Lentil), Rapeseed & Mustard, Safflower) and two other commercial crops.

## Why do MSPs matter?

**Safety net for farmers:** By announcing MSPs, the government makes a promise that it will buy (called procurement) from farmers at the announced prices.

**To protect consumers:** If one particular crop, led to the ruin of many farmers, then farmers will avoid growing cotton next season. This, in turn, will reduce supply and push up prices. Higher prices will then show up across the different products for consumers.

**To tweak the production pattern:** If the government wants to incentivise the production of pulses, as against paddy (rice), then it can give a relatively higher hike in the MSP of pulses than the MSPs for paddy.

## LIBERALISED REMITTANCE SCHEME

### Why in News?

Recently, the Finance Ministry of India, in consultation with the Reserve Bank of India (RBI), has made significant amendments to the Foreign Exchange Management Act (FEMA), bringing international credit card spending outside India under the Liberalised Remittance Scheme (LRS).

This comes in the backdrop of a surge in spending in overseas travel. Indians spent 12.51 billion USD on overseas travel between April-February of fiscal 2022-23, a rise of 104% compared to the same period of the last year.

### What happens next?

As a consequence, the spending by international credit cards will attract a higher rate of TCS at 20 per cent effective July 1, 2023. At present, a TCS levy of 5% will come into effect on such transactions till July 1 (except for medical and education-linked sectors), which would then increase to 20 per cent after July 1.

### What is Liberalised Remittance Scheme?

The Liberalised Remittance Scheme (LRS) of the Reserve Bank of India (RBI) allows resident individuals to remit a certain amount of money during a financial year to another country for investment and expenditure. It was introduced in 2004 with the limit of \$25,000 per financial year.

According to the prevailing regulations, resident individuals may remit up to \$250,000 per financial year. This money can be used to pay expenses related to travelling (private or for business), medical treatment, studying, gifts and donations, maintenance of close relatives and so on.

Apart from this, the remitted amount can

also be invested in shares, debt instruments, and be used to buy immovable properties in overseas market. Individuals can also open, maintain and hold foreign currency accounts with banks outside India for carrying out transactions permitted under the scheme.

The Scheme is not available to corporations, partnership firms, Hindu Undivided Family (HUF), Trusts etc.

### What is Tax Collected at Source?

**Tax Collected at Source**, or TCS is the tax imposed on goods by the sellers that are collected from the buyers at the time of sale. This tax collected is then transferred from the seller to the government.

The items on which TCS can be levied are listed in Section 206C of the Income Tax Act, 1961. Some of these items include timber wood, liquor, minerals like lignite and coal, parking lots, toll plazas etc. The limit for TCS on the sale of goods is Rs. 50 lacs.

For example, Suppose you want to purchase timber from a timber trader for Rs. 50,000. But you will pay him a total amount of Rs. 52,000 (50,000 + 5% of 50,000). The surplus Rs. 2,500 is the TCS you will pay to the timber trader. While filing your ITR, you can claim a credit of Rs. 2,500 for the total tax liability. This is known as TCS credit.

And it is different from the **Tax Deducted at Source** or TDS which is an indirect type of tax, where revenue collection is done directly at the point of the recipient's income. TDS uses the notion of 'pay as you earn' and 'collect when it is earned'.



## SUNFLOWER OIL

### Why in News?

Global prices of edible oils, which hit an all-time high after Russia's invasion of Ukraine, have crashed. Sunflower has seen the greatest volatility over the last 1 year — and as India's oil imports seem set for a record high this Nov-Oct year, sunflower, along with palm, has led the surge.

Within the vegetable fats complex, the oil that has witnessed the highest price rise and fall in just the last one year is sunflower.

However, the situation changed with the Black Sea Grain Initiative agreement between Russia and Ukraine signed on July 22. The deal, brokered by the UN and Turkey, facilitated the safe navigation of vessels carrying grain and foodstuffs from three designated Ukrainian ports.

**Ukraine (the highest producer)** and Russia account for 60% of the world's sunflower oil production

Other top producers of sunflower oil globally include Ukraine, Russia, Argentina, Romania, and Bulgaria.

### In India:

Sunflower oil is the fourth most consumed edible oil in India, following mustard, soybean, and palm oil.

Domestic production of sunflower oil has significantly declined over the past decade, unlike soybean oil, which has expanded its cultivated area.

India imports a substantial amount of sunflower oil due to limited domestic production.

**Major producers: Karnataka** (highest producer in India); Telangana and Maharashtra

**Major Consumer:** Karnataka, Telangana, and Maharashtra

### About Sunflower:

Sunflower (*Helianthus annuus* L.), popularly known as "Surajmukhi" (it follows the sun by day) is an annual flowering plant, native to North and Central America but is now cultivated worldwide for its versatile uses. Sunflowers are relatively easy to grow and are adaptable to different climates and soil types. They are known for their ability to extract heavy metals from the soil, making them useful in phytoremediation efforts to clean up polluted areas.

## GOVERNMENT IMPOSES CEILING ON WHEAT STOCKS

Recently, the Ministry of Consumer Affairs, Food & Public Distribution has imposed limits on the Stock of Wheat that can be held by traders, wholesalers, retailers, big chain retailers and

processors.

The objective is to stabilise the price of the essential commodity by steadying supply and ensuring overall food security by preventing

### Wheat cultivation in India

- Wheat is a Rabi Crop.
- Temperature requirements: Between 10-15°C (Sowing time) and 21-26°C (Ripening & Harvesting) with bright sunlight.
- Rainfall or water requirement: Around 75-100 cm.
- Soil type: Well-drained fertile loamy and clayey loamy.
- Major producers: Uttar Pradesh > Punjab > Madhya Pradesh > Haryana > Rajasthan.

hoarding and unscrupulous speculation.

### **The imposed limits include**

The permissible stock that traders/wholesalers can hold is 3,000 metric tonnes.

Retailers and big chain retailers can hold up to 10 metric tonnes at each of their outlets, while the latter can hold up to 3,000 metric tonnes at all their depots combined.

Processors would be able to stock 75% of the annual installed capacity.

If the stock held by them is higher than the limit, they will have 30 days from the day of issue of notification to bring the same under the

prescribed limits.

### **Additionally,**

The government has also decided to offload 15 lakh tonnes of wheat from the central pool via the Open Market Sale Scheme (OMSS) to flour mills, private traders, bulk buyers, and manufacturers of wheat products through e-auction.

It aims to control retail prices of wheat.

### **Need for the move**

Due to high heat in the summer months affecting crops.

Major wheat-producing states experiencing

# ODISHA TRAGEDY AND RAIL SAFETY

*GS-III Infrastructure: Energy, Ports, Roads, Airports, Railways etc, Disaster and disaster management.*

The Coromandel Express accident at Bahanaga Bazar railway station of the South Eastern Railway in Balasore district of Odisha calls into question the objective of Indian Railways—to run fast and safe trains at affordable cost. It has also brought to light the Government of India's failure to invest in safety and expansion of infrastructure.

## Status of Rail infrastructure in India

Indian Railways has a multi-gauge, multi-traction system covering over sixty eight thousand kilometers of route length (as on dec 2022).

India's track density is comparable to the track density in the United States but much lower than that of Germany, Russia, China or Canada.

## Issues with Infrastructure-

High capacity utilisation exceeding 100% where 80% is the optimum level

Highly non uniform and imbalance rail traffic network

Line capacity is severely constrained due to introduction of more trains over the years

Capacity constraints and oversaturation in the network also affects Railways' ability to meet customer expectations

*Poor investment has resulted in a decline of Railways'*

*share across all transport modes*

The speed of freight trains has been around 25-30 kmph for a long time.[22] The maximum permissible speed on Indian Railways is between 100 kmph to 160 kmph, and the actual speed achieved is lower, in the range of 60-70 kmph. In comparison, in several developed countries, the conventional trains have a maximum permissible speed of 200 kmph, while high speed trains have speeds between 300-350 kmph.

## Types of Rail accidents

- Equipment Failure
- Derailments
- Fire
- Manned Level crossing / Unmanned level crossing
- Others

## Causes of rail accidents

Inherent defect in the system of working or in the physical appliances

Issues in the track maintenance

Deviation of track parameters (alignment, gauge length etc.) beyond a permissible limit

Water logging / Improper drainage on the track

Existence of sharp curve

Technological and inspectional deficiencies in the

new constructions.

Overspeeding\ Bad driving by the loco pilots

Invalid brake power certificate -( The Brake Power Certificate is a certificate stating the fitness of the rail for operations. It is issued to the loco pilot and guard by a Train Examiner of the Mechanical Department who inspects the rake and carries out necessary repair work. It can only be issued after a thorough check of the braking system and other safety parameters.

- Poor working/ Failure of the station master
- Visibility issues due to weather conditions
- Lack of discipline in inspection schedules
- Lack of safety checks

## Issues with the organisational structure

**Centralized decision-making:** Decision-making in the railways is centralized, with limited autonomy for zones. General Managers (GMs) have seen a reduction in their powers, primarily for budgetary control purposes. As a result, GMs have little independence in decision-making, and financial decisions are made by the Railway Board rather than at the zone level.

**Lack of financial**

**autonomy:** Zones prepare their annual budgets based on the financial outlay provided by the Railway Board. They do not have the power to make independent financial decisions or generate their own revenue. This lack of autonomy hampers their ability to manage their finances effectively and be accountable for their own transport output and profitability.

**Non-remunerative peripheral activities:** Indian Railways engages in peripheral activities such as running schools, hospitals, real estate development, catering, and security. Many of these activities are unprofitable and pose a financial burden on the railways.

Railways' monopoly discourages private sector entry into the market. Schemes for private sector participation are not prepared with the involvement of stakeholders. Further, the schemes are designed such that the risks lie mostly with the private parties.

Large scale staff shortages in the working of the railway board

## Safety Mechanisms

Improvement in Rail safety is *a continuous process* and constant endeavour is made to improve the same. **Safety Audits/inspections** are undertaken at regular intervals on all railway infrastructures with a view to identify weak

areas in asset maintenance, safety procedure and systemic defects and to provide ways and means to prevent accidents. Besides, *periodical safety drives* are launched from time to time to indicate safety consciousness amongst staff and to streamline safety aspects including maintenance of assets

## Steps taken to reduce accidents

**Technological Upgradation:** Improved design and features of coaches and wagons. This includes introducing Modified Centre Buffer Couplers, Bogie Mounted Air Brake System (BMBS), improved suspension design and provision of Automatic fire & smoke detection system in coaches. It also includes installing KAVACH - an indigenously developed Automatic Train Protection (ATP).

**LHB Design Coaches:** Lighter and safer coaches for Mail/Express trains. These coaches are based on German technology and have better anti-climbing features, fire retardant materials, higher speed potential and longer service life than conventional ICF design coaches.

**GPS based Fog Pass Device:** A device to help loco pilots navigate in foggy conditions. It is a GPS enabled hand-held device that displays the exact distance of the approaching landmarks such

as signals, level crossing gates, etc. It also alerts the loco pilot with a loud buzzer when the train approaches a signal or a level crossing gate.

**Modern Track Structure:** Stronger and more durable tracks and bridges. This includes using Prestressed Concrete Sleeper (PSC), higher Ultimate Tensile Strength (UTS) rails, fan shaped layout turnout on PSC sleepers, Steel Channel Sleepers on girder bridges, etc.

**Ultrasonic Flaw Detection (USFD):** A technique to detect and remove faulty rails. It is a non-destructive testing method that uses high frequency sound waves to inspect the rails for cracks, defects or flaws that may cause derailments or accidents. The defective rails are then removed and replaced with new ones.

**Mechanization of Track Maintenance:** A system to automate and optimize track maintenance. This includes using machines such as track tamping machines, ballast regulating machines, dynamic track stabilizers, etc to carry out track maintenance activities such as tamping, dressing, stabilizing, etc. This reduces human errors and improves track quality and safety.

**Interlocking System:** A system to control points and signals centrally. It is a system that uses electrical or electronic devices to operate the points and signals from a

central location. It eliminates the need for manual operation of points and signals by staff on the ground. It also reduces the chances of human failure and enhances safety.

**Elimination of Unmanned Level Crossings (UMLCs):** UMLCs are being eliminated progressively by closing, merging, manning, or providing subways/road under bridges/road over bridges.

### Kavach

It is India's very own automatic protection system in development since 2012, under the name Train Collision Avoidance System (TCAS). Later, it got rechristened to Kavach or "armour".

Basically, Kavach is a state-of-the-art electronic system which was designed to help the Indian Railways achieve Zero Accidents.

It has been indigenously developed by the Research Design and Standards Organisation (RDSO) in collaboration with the Indian industry.

Trails were facilitated by South Central Railway to achieve the corporate objective of safety in train operations.

### Functioning

A set of electronic devices and Radio Frequency Identification devices installed in locomotives, in the signalling system as well the track.

This enables the locomotives, signalling system

and tracks to talk to each other using ultra high radio frequencies to control the brakes of trains and also alert drivers.

### Features

It activates the train braking system automatically if the driver fails to control the train as per the speed restrictions.

In addition, it prevents collision between two Locomotives equipped with a functional KAVACH system.

It is designed to assist locomotive pilots in avoiding Signal Passing At Danger (SPAD) and over speeding.

Automatic Braking for Prevention of Over Speeding

Auto Whistling while approaching Level Crossing Gates

SoS Messages during emergency situations

Centralised live monitoring of Train movements through Network Monitor System

### Bodies involved -

Railway Board (RB) is at the apex, a part of the Ministry of Railways (MoR).

At RB level, safety issues are dealt by the **Safety Directorate** under Member (Operations and Business Development) erstwhile Member (Traffic).

At Zonal level, **Principal Chief Safety Officer (PCSO)** under the GM is the coordinating authority and at Divisional level, Senior

Divisional Safety Officer/ Divisional Safety Officer is the coordinating authority.

**Commissioner of Railway Safety (CRS)** under the Ministry of Civil Aviation oversees the safety system in Railways through regulatory, inspectorial and investigative functions. All serious accidents are required to be reported to the CRS by the Railway Administration for investigation and report

In case Commissioner of Railway Safety or Chief Commissioner of Railway Safety is not in a position to inquire into serious accident cases involving coaching train, notified to him under section 113 of Railway Act, the inquiry shall be carried out by a **committee of SA grade Officers** and CSO of the Railway shall be Convener / Chairman of such committee.

### The Commissioner of Railway Safety:

**Section 113 of the Railways Act, 1989** required intimation of serious accidents to be sent to the Commissioner of Railway Safety.

Under the Statutory Investigation into **Railway Accidents Rules, 1998** issued by the **Ministry of Civil Aviation**, a statutory inquiry by the Commissioner of Railway Safety is obligatory in every serious accident to a train carrying passengers which is attended with loss of human life, or with grievous hurt, as defined in the Indian Penal Code, to a passenger

or passengers in the train or with serious damage to railway property of the **value exceeding ₹ 2 crore in each case.**

While holding statutory inquiry, the Commission not only examines affected passengers but also invites members of the public to give evidence in person during the inquiry or to write to the Commission

### Rail Safety Fund

The Minister of Finance in Budget Speech 2017-18, announced a Fund namely 'Rashtriya Rail Sanraksha Kosh' (RRSK) under capital segment of Budget.

The RRSK had been created in 2017-18 with a **corpus of ` 1.00 lakh crore** over a period of **five years** with an **annual outlay of ` 20000 crore.**

The Ministry of Finance had issued (July 2017) **guidelines for 'Operation of RRSK'** by the MoR.

The mandate of RRSK is to **finance critical safety related works of renewal, replacement and augmentation of assets.**

The Planning Directorate of RB has been assigned the task of regularly monitoring physical and financial progress of works funded through RRSK.

Safety related works on IR were mainly funded through Railway Safety Fund. All track renewals works were earlier financed out of Depreciation Reserve Fund (DRF), which included track renewals, re-building of bridges etc.

### Parliamentary Standing Committee on Railways (2016) - Findings and Recommendations

Tracks are the backbone of the system of railways. It is essential that 4500 Km of the tracks should be renewed annually. But the efforts are

not commensurate with the required target. There is a shortfall in complete track renewal work. IR should prioritize the planning and execution of track renewal work to eliminate the accidents because of Permanent Way.

Loco pilots are responsible to the accidents caused by the collisions and signal Passing at Danger (SPAD). Though there is a substantiable increase in the number of signals, there is no technological support to the loco pilots and they are to depend on the vigilant manual watching of signals. SPAD being a potential case of accidents need to be minimized strictly. This further emphasized the need of developing and providing technological aid (TPWS-Train Protection and Warning System, TCAS-Train Collision Avoidance System) to the Loco-Pilot at a greater pace to prevent SPAD.

## THE TROUBLES OF INDIA'S AVIATION INDUSTRY

*GS-III Infrastructure: Energy, Ports, Roads, Airports, Railways etc.*

### Why in News?

After low-cost carrier GoFirst's insolvency filing earlier, the aviation safety regulator Directorate General of Civil Aviation (DGCA) recently directed the airline to stop selling air tickets immediately. The DGCA issued GoFirst a showcause notice for its "failure to continue the operation of the service in a safe, efficient and reliable manner", giving it 15 days to reply before the

regulator decides on revoking the airline's permit to offer commercial flights.

### How big is the Indian aviation sector?

There are currently 148 airports in the country.

India is the third-largest domestic market in the world in terms of seat capacity.

In March 2023, domestic carriers flew 11% more

passengers than the same month in the pre-pandemic years of 2018 and 2019.

Travel restrictions during the pandemic had hit the carriers.

As of March 2023, IndiGo remained the domestic market leader with 56.8% of the market share, followed by Vistara (8.9%) and Air India (8.8%).

## Is the sector financially viable?

Even though India's aviation industry is the 'fastest growing aviation sector' in the world, airlines in India are struggling to survive in the highly competitive environment.

India's airlines suffered huge losses (₹15,000 crore) in the financial year 2020-2021 due to the pandemic but such losses are not only a post-Covid phenomenon.

Financial trouble has led to the closure of major airlines in the past few decades- 17 airlines both domestic and regional have been shut.

The consolidation of 4 carriers under one umbrella by the Air India of Tata Airlines will make it tougher for smaller airlines to compete in the market.

India has not kept pace with modern technology in aerospace and increasing costs might ultimately affect passenger growth.

## Regulating Authority

Aviation policy is dealt by the Ministry of Civil Aviation under the Aircraft Act 1934, and Aircraft Rules 1937.

The Directorate General of Civil Aviation (DGCA) is the statutory regulatory authority that is empowered to look after the issues related to safety, licensing, airworthiness etc.

## Challenges with government policies

After liberalisation, cost of operation was still high as government levied high taxes on Aviation Turbine Fuel (ATF).

The tax is the single biggest expenses of carriers, amounting to 40-50% of operational expenses.

Some Indian States also impose provincial taxes of approx. 30% on jet fuel.

The National Civil Aviation Policy (NCAP) in 2016 had removed the 5-year domestic experience rule for domestic airlines to conduct operations but mandated the 20 aircraft fleet requirement (or 20% of entire fleet whichever is higher).

Most Indian airlines do not own their entire fleets due to not being economic but rather they lease them from companies based out of India.

About 80% of India's total commercial fleet is leased from U.S and paid in dollars.

Many Airlines have to pay annual lease rents to lessors which makes up nearly 15% of the revenues of Indian Airlines.

The costs of these leases increases when the Indian rupee depreciates during short and long-term global financial developments.

Other costs borne by airlines: airport fees for the use of airport facilities including aircraft landing, freight and charges related to the use of airport infrastructure such as runways and passenger terminals.

For State-run airports, these charges are regulated by the Airports Economic Regulatory Authority (AERA).

But recent privatisation has led to charging higher fees from the airlines.

There are high costs associated with the training of airline crew.

# GEOGRAPHY,

# ENVIRONMENT,

# BIODIVERSITY AND

# DISASTER MANAGEMENT

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# STRUCTURAL SAFETY CENTRE ON DAMS

## Concept:

Jaipur to have centre on structural safety on dams.

## Background:

Malviya National Institute of Technology (MNIT) in Jaipur has been identified as the National Centre for Earthquake Safety of Dams, the first centre of its kind in the country.

The centre will develop indigenous capabilities in making the country self-reliant in handling technology issues related to structural and earthquake safety of dams.

Earthquake shaking is considered the most significant threat to the safety of dams.

Following the signing of a memorandum of understanding with the National Dam Safety Authority (NDSA), functioning under the Union Ministry of Jal Shakti, the new centre will work intensively with dam engineers, regulators and policy makers.

## About Dam Safety Act 2021

**Applicability:** It applies to all specified dams in the country.

These are dams with height more than 15 metres height between 10 metres to 15 metres and subject to certain additional design and structural conditions.

**National Committee on Dam Safety:** The National Committee on Dam Safety will be constituted and will be chaired by the Chairperson, Central Water Commission.

All other members will be nominated by the central government, and include: Up to 10 representatives of the central government, up to seven representatives of the state governments (by rotation) up to three dam safety experts.

Functions of the Committee include: policies and regulations regarding dam safety standards and prevention of dam failures analysing causes of major dam failures and suggesting changes in dam safety practices.

## National Dam Safety Authority:

The National Dam Safety Authority will be headed by an officer, not below the rank of an Additional Secretary, who will be appointed by the central government.

**Functions of the Authority:** include implementing the policies formulated by the National Committee on Dam Safety, resolving issues between State Dam Safety Organisations (SDSOs), or between a SDSO and any dam owner in that state, specifying regulations for inspection and investigation of dams, providing accreditation to agencies working on construction, design, and alteration of dams.

State Committees on Dam Safety have been provided in Schedules to the act. It specifies that the central government can amend these Schedules through a notification, if deemed necessary.

**Obligations of dam owners:** Owners of specified dams are required to provide a dam safety unit in each dam. This unit will inspect the dams: before and after the monsoon session during and after every earthquake, flood, or any other calamity or sign of distress.

Dam owners will be required to prepare an emergency action plan, and carry out risk assessment studies for each dam at specified regular intervals.

Dam owners will also be required to prepare a comprehensive dam safety evaluation of each dam, at regular intervals, through a panel of experts.

The evaluation will be mandatory in certain cases such as major modification of the original structure, or an extreme hydrological or seismic event.

# OWNERSHIP OF LITHIUM RESOURCES

## Why in news?

Recently, a significant reserve of lithium has been found in the Raesi district of Jammu and Kashmir UT.

## About

The news of potentially significant reserves of lithium, an element needed to manufacture batteries used in electric cars and other renewable energy infrastructure, in Jammu and Kashmir has been welcomed universally. Commentators have called this a boost for national prosperity and security without dismissing concerns about the potential social and environmental impacts.

## Who should own these minerals?

In July 2013, a three-judge bench of the Supreme Court of India ruled that **the owner of the land has rights to everything beneath**, “down to the centre of the earth”.

Yet, large areas of land, including forests — which make up more than 22% of India’s landmass — hills, mountains, and revenue wasteland are publicly owned.

The Supreme Court also recalled that the **Union government could always ban private actors from mining sensitive minerals**, as is already the case with uranium under the Atomic Energy Act 1962. In today’s context, lithium is as important as, if not more than, uranium.

## How do other countries manage lithium reserves?

The stories of two South American countries, Chile and Bolivia — which have the largest known reserves of lithium — are particularly instructive.

## Chile

In Chile, the government has designated **lithium as a strategic resource** and its development has been made the **exclusive prerogative of the**

state.

The state has licensed **only two companies** to produce lithium in the country.

In April 2023, Chile’s president Gabriel Boric announced a new “**National Lithium Strategy**”, which many in the corporate sector took to be a declaration of his intention to **nationalise the industry**.

As a supplement, the new strategy calls for **public-private partnerships for future lithium projects**, which will allow the state to **regulate the environmental impact of lithium-mining**, distribute the revenue from lithium production more fairly among local communities, and promote domestic research into lithium-based green technologies.

## Bolivia

Bolivia’s new constitution, gave the state “**the control and direction over the exploration, exploitation, industrialisation, transport, and commercialisation of natural resources**.”

Bolivia **nationalised lithium** and adopted a hard line against private and foreign participation.

## Mexico

Mexico also **nationalised lithium** in February this year, declaring, “Oil and lithium belong to the nation, they belong to the people of Mexico.”

In general, the countries in Latin and South America are thinking through ways and means to pursue a multi-pronged strategy. While the national governments of these countries exercise a significant degree of control, the nature of private sector participation varies between these countries.

# CHANGING BEHAVIOUR OF WESTERN DISTURBANCES

## Why in news?

For at least three years now, western disturbances have displayed unusual behaviour in India

## About

### Western Disturbance

A western disturbance is an **extratropical storm** originating in the **Mediterranean region** that brings sudden winter rain to the northern parts of the Indian subcontinent, which extends as east as up to northern parts of Bangladesh and South eastern Nepal.

It is a **non-monsoonal precipitation pattern** driven by the **westerlies**. The moisture in these storms usually originates over the Mediterranean Sea, the Caspian Sea and the Black Sea.

Extratropical storms are a global phenomena with moisture usually **carried in the upper atmosphere, unlike their tropical counterparts** where the moisture is carried in the lower atmosphere.

In the case of the Indian subcontinent, moisture is sometimes shed as rain when the storm system encounters the Himalayas. Western disturbances are more frequent and stronger in the winter season

## Genesis

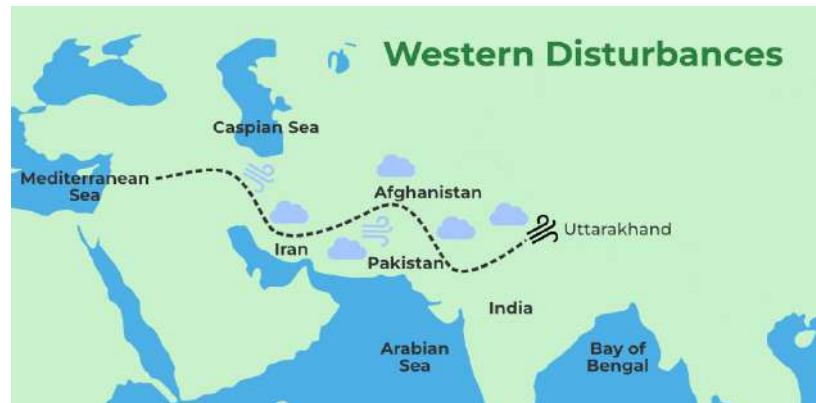
A high-pressure area over Ukraine and neighbourhood consolidates, causing the intrusion of cold air from polar regions towards an area of relatively warmer air with high moisture. This generates favorable conditions for cyclogenesis in the upper atmosphere, which promotes the formation of an eastward-moving extratropical depression.

## Impact:

Plays important role in **bringing moderate to heavy rain in low-lying areas** and heavy snow to mountainous areas of the Indian Subcontinent.

This disturbance is usually associated with **cloudy sky, higher night temperatures and unusual rain**. This precipitation has great importance in **agriculture**, particularly for the Rabi crops. Wheat among them is one of the most important crops, which helps to meet India's food security.

Excessive precipitation due to this disturbance can cause **crop damage, landslides, floods and avalanches**. Over the Indo-Gangetic plains, it occasionally bring **cold wave conditions and dense fog**. These conditions remain stable until disturbed by another western disturbance. When western disturbances move across northwest India before the onset of monsoon, a temporary advancement of monsoon current appears over



the region.

## Changing Patterns

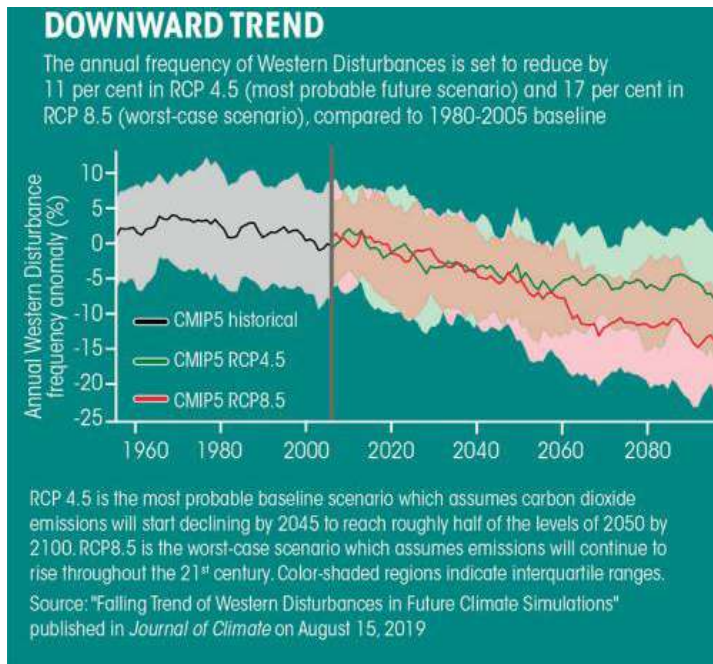
Western Disturbances are growing elusive, a trend that is likely to worsen in the future. Western Disturbances are sometimes getting typically weaker and therefore associated with less precipitation. When they are associated with extreme precipitation, the extremes are getting much worse

Western Disturbances in December were weak in five of the past eight years, barring 2017

and 2019

But since 2019, winter has been largely dry across the country. Western disturbances arrived late in 2023 and began to intensify around March. They reached a climax in May, which received 175 per cent more rainfall than normal and saw maximum and minimum temperature 10 per cent and 20 per cent below normal, respectively

Between 1971 and 2021, the annual duration



of a western disturbance in Solan, which on an average lasts for 139 days from October to May, has reduced at a rate of 0.29 days or about eight hours per year. While the onset of the events, has advanced by 0.19 days per year, their withdrawal has delayed by 0.11 days per year.

Change in onset of western disturbances leads to variation in sowing of rabi crops, particularly in regions that lack irrigation facilities and where farmers largely depend on rainfall for agriculture

In the winter of 2022-23, India recorded just three intense Western Disturbances, against the average of 4-6 intense events each

The month december saw only one weak Western Disturbance. Consequently, it was the hottest December on record. Northwest India received only 17 per cent of its normal rainfall

JANUARY received five Western Disturbances, but only two of them were intense. The month received moderate to heavy snowfall, leading to a winter chill across northwest India FEBRUARY saw four weak Western Disturbances. The year recorded the hottest February since 1901 and was sixth driest on record. MARCH recorded 1 severe Western Disturbance till March 7 that triggered hailstorms in Gujarat, Rajasthan and Maharashtra

## Reasons for changing behaviour

**La Nina** - La Niña phase of the El Niño- Southern Oscillation reduces the temperature of the hot tropical air that is crucial for the temperature gradient for the formation of Western Disturbances. For the past three years, the world has been in a La Niña phase

**North Atlantic Oscillation** It is a random fluctuation of air pressure over the North Atlantic Ocean due to a high-pressure region above the Azores Islands and a low-pressure region over Iceland. It is currently in a negative phase and it reduces the frequency and intensity of Western Disturbances

**Subtropical Westerly Jet stream** It is the wind system which brings Western Disturbances to India. The jet stream is shifting northwards during winters, which reduces winter precipitation in northwest and central India, and southwards during summers, increasing the chances of extreme rainfall events

**Arctic Warming** The Arctic warming makes the polar jet stream wavier and increases the chance of it merging with the subtropical westerly jet stream in winters. This causes the jet stream to move northwards and reduces precipitation

## Impact of changing pattern

The changing onset and withdrawal of western disturbances have a direct impact on crop sowing and harvesting. Variations in the timing of these weather events can lead to irregularities in crop sowing, delayed harvests, and increased vulnerability to excess rainfall. This especially affects regions lacking irrigation facilities and

relying heavily on rainfall for agricultural activities.

## GROUND WATER EXTRACTION TILTS EARTH

### Why in news?

The Earth has lost enough groundwater to thirsty humans to measurably tilt the planet's axis of rotation. That has caused the geographic North Pole to shift at a speed of 4.36 centimetres per year, researchers have calculated. The results appeared on 15 June in *Geophysical Research Letters*.

### About

Earth has lost enough groundwater to thirsty humans to measurably tilt the planet's axis of rotation.

The net water lost from underground reservoirs between 1993 and 2010 is estimated to be more than 2 trillion tons.

*The tilt of the axis on which any celestial object spins tends to be stable. But small changes can occur when large masses shift location inside a planet and on its surface. "Every mass moving around on the surface of the Earth can change the rotation axis.*

Astronomers can track such motions in the Earth's axis by observing quasars, the bright centres of distant galaxies that constitute practically immobile points of reference. The largest axis change is seasonal and is triggered by the motion of atmospheric masses as the weather and seasons change. This effect causes the Earth's geographic poles to wobble by up to several metres every

year. Other factors contributing to polar motion include **Weather, Seasonal Changes, the molten Core, and powerful Hurricanes.**

Polar motion is the **movement of the Earth's rotational axis** relative to its crust, reflecting the influence of the material exchange and mass redistribution of each layer of the Earth on the Earth's rotation axis. Generally, polar motion is caused by changes in the **hydrosphere, atmosphere, oceans, or solid Earth.**

According to the findings the Earth has tilted as much as 80 centimetres (31.5 inches) between 1993 and 2010, which has been attributed to humans pumping out groundwater and moving it elsewhere.

### Other effects of ground water extraction

- Depletion of aquifers
- Land subsidence
- Saltwater intrusion
- Ecological impact
- Reduced baseflow to rivers
- Water scarcity
- Subsidence-induced infrastructure damage
- Well failure

## UNDERVALUED ROLE OF VOLCANIC ERUPTIONS IN CLIMATE

### Why in news?

New research has discovered that the cooling effect produced by volcanic eruptions on Earth's surface temperature is likely underestimated by a factor of two, and potentially up to four, in standard climate models. This revelation, while not significant enough to counteract human-induced global warming, alters our understanding of the complex global climate system.

### About

#### Volcanic Eruptions and climate

The course of volcanic eruptions – both their location and timing – remains beyond human control. Yet, the role they play in the global climate system is undeniably important. Upon eruption, volcanoes emit sulfur gases into the upper atmosphere, which subsequently form tiny

aerosol particles capable of reflecting sunlight back into space.

Volcanic eruptions can release chlorine and bromine-containing gases, such as hydrogen chloride (HCl) and methyl chloride (CH<sub>3</sub>Cl). These gases can contribute to the destruction of ozone molecules in the stratosphere, leading to localized ozone depletion. However, the magnitude of this effect is usually smaller compared to the ozone-depleting substances emitted by human activities, such as chlorofluorocarbons (CFCs).

Major eruptions, such as the Mount Pinatubo incident in 1991, spew such a vast volume of volcanic aerosols that they single-handedly trigger a dip in global temperatures. But these large eruptions are relatively rare, occurring only a few times per century. On the other hand, small-scale eruptions occur every one to two years.

Compared with the greenhouse gases emitted by human activity, the effect that volcanoes have on the global climate is relatively minor, but it's important that we include them in climate models, in order to accurately assess temperature changes in future.

Current climate projections, such as those outlined in the Intergovernmental Panel on Climate

Change (IPCC) Sixth Assessment Report, base their assumptions on calculations of past volcanic activity (from 1850-2014) and estimates of future activity (from 2015-2100). This approach largely overlooks the impacts of small-scale eruptions.

These projections mostly rely on ice cores to estimate how volcanoes might affect the climate, but smaller eruptions are too small to be detected in ice-core records,

Volcanic aerosols in the upper atmosphere typically stay in the atmosphere for a year or two, whereas carbon dioxide stays in the atmosphere for much, much longer," said Chim. "Even if we had a period of extraordinarily high volcanic activity, our simulations show that it wouldn't be enough to stop global warming. It's like a passing cloud on a hot, sunny day: the cooling effect is only temporary."

Despite the underestimation of volcanic activity in climate projections, it's important to note that the cooling effect of volcanoes does not compare to the warming effect of anthropogenic carbon emissions. However, the study underlines the importance of fully accounting for the role of volcanoes in our climate models to ensure their reliability.

## ALPS: LIGHTNING ACTIVITY DOUBLED IN A FEW DECADES

### Why in news?

In the high altitudes of the European Eastern Alps, the number of detected lightning strikes has doubled in the course of the last 40 years. Causes for this are to be found in the effects of the climate crisis. A team of Innsbruck researchers from the Departments of Geosciences, Atmospheric Sciences and Statistics has now published their findings in the journal *Climate Dynamics*.

### About

The climate crisis is leading to an increase in extreme weather events today and in the future, as the Intergovernmental Panel on Climate Change (IPCC) has already pointed out several times. How the consequences of global warming affect

small-scale and local weather phenomena such as lightning activity is still not fully understood.

Mountainous areas have good conditions for the development of thunderstorms due to its topography alone. The analyses over this terrain have now shown that the rising temperatures due to climate change are causing the frequency of thunderstorms and thus lightning to increase even further

According to the Innsbruck scientists, the most intensive changes occurred in the high Alps between 1980 and 2019. "There, lightning activity doubled in the 2010s compared to the 1980s. In the high-altitude areas of the Eastern Alps, the lightning season reaches a stronger maximum and

starts a month earlier. During the day, the peak is up to 50 per cent stronger, with more lightning in the afternoon and evening

### Harmful effects of Cloud-to-ground lightning:

Cause power outages by damaging electricity supply infrastructure.

Can spark fires at the sites they strike.

People may get injured and even be fatally struck by lightning.

Lightning also injects air pollutants like NO<sub>x</sub> and ozone into the atmosphere and threatens permafrost.

### Link between lightning and climate change-

**Warming Atmosphere:** Climate change is primarily driven by the increasing concentrations of greenhouse gases, such as carbon dioxide, in the atmosphere. As global temperatures rise, the atmosphere becomes warmer. Warmer air can hold more water vapor, which provides the necessary fuel for thunderstorm formation. Thus, a warmer atmosphere may create conditions that favor more frequent and intense thunderstorms, potentially leading to increased lightning activity.

**Changes in Precipitation Patterns:** Climate change can also alter precipitation patterns, including the distribution, intensity, and frequency of rainfall. Certain regions may experience more frequent and intense rainfall events, while others may face prolonged droughts. Changes in precipitation patterns can influence the availability of moisture in the atmosphere, affecting thunderstorm development and subsequently impacting lightning activity.

**Feedback Effects:** Lightning itself can have feedback effects on climate. Lightning produces nitrogen oxides (NO<sub>x</sub>), which can react with other atmospheric constituents to form ozone. Ozone is a potent greenhouse gas that contributes to the warming of the lower atmosphere. Increased lightning activity could, therefore, lead to elevated levels of ozone and potentially contribute to further warming of the climate system.

**Wildfires:** Lightning strikes are a significant natural ignition source for wildfires. Climate change can create conditions that are more conducive to wildfires, such as prolonged droughts, increased fuel availability, and drier vegetation. Changes in lightning patterns, coupled with these favorable conditions, can potentially increase the risk of wildfires, further impacting ecosystems, air quality, and regional climate.

## GREEN CREDIT PROGRAMME

### Why in news?

The Ministry of Environment and Forests has put forward a pioneering initiative called the Green Credit Programme, aimed at incentivising environmentally conscious practices and promoting a sustainable lifestyle known as 'LiFE' (Lifestyle for Environment). In a recent notification, the government introduced the "draft Green Credit Programme Implementation Rules 2023" to lay the foundation for this innovative scheme.

### About

It is a Domestic voluntary market mechanism which proposes a Market based approach for green credits encouraging individuals and companies to adopt responsive actions that prioritize

environmental well-being.

The 'Green Credit' means a singular unit of an incentive provided for a specified activity, delivering a positive impact on the environment.

The Green Credit Programme as a mechanism that complements the domestic Carbon Market.

The programme is to be implemented under the purview of Environment Protection Act, 1986

The Indian Council of Forestry Research and Education (ICFRE) shall be the administrator of the programme which will develop guidelines, processes and procedures for implementation of the programme.

**Beneficiaries** - individuals, private sectors,

small scale industries, cooperatives, forestry enterprises and farmer-produce organisations, urban and rural local bodies

The government informed that in the beginning, Green Credits will be made available to individual and entities, engaged in selected activities and who undertake environmental interventions. These Green Credits will be made available for trading on a domestic market platform.

It added that benchmarks will be developed for each Green Credit activity for generating and issuance of Green Credits

### Identified sectors for the first phase of implementation

Tree plantation

water harvesting and water use efficiency/savings, including treatment and reuse of wastewater

Promotion of sustainable agricultural practices

Promotion of sustainable practices of waste management

Promotion of measures to curtail air pollution

Mangrove conservation measures

encouraging manufacturers to obtain Ecomark label for their goods and services.

Sustainable building and infrastructure

### Significance of the GCP:

It's a first-of-its-kind instrument that seeks to value and reward multiple ecosystem services to allow green projects to achieve optimal returns beyond just carbon.

The scheme will allow project proponents to also access carbon markets additionally.

Similar mechanisms elsewhere: In some countries (France, Germany and Sweden), social services generate credits – taking care of the elderly for a certain number of hours, for instance, gets one some credit that you can exchange in a salon.

### Concerns:

The draft was a good statement of intent but its implementation would be extremely challenging.

This is due to the difficulty in establishing the equivalence between various actions.

For example, how much water one saved is equivalent to a tonne of CO2 prevented from emissions is difficult to establish.

Monitoring, reporting and verification challenges.

A strong risk of greenwashing – the appearance of doing a lot without actually achieving much beneficial impact.

## UNIVERSE'S 'NOISY' GRAVITATIONAL WAVE BACKGROUND

### Why in news?

For the first time, scientists have observed faint ripples caused by the motion of black holes that are gently stretching and squeezing everything in the universe. On June 28, they reported that they were able to “hear” what are called low-frequency gravitational waves which are the changes in the fabric of the universe that are created by huge objects moving around and colliding in space.

### About

Gravitational waves are invisible, however, are incredibly fast. They travel at the speed of

light (186,000 miles per second). They squeeze and stretch anything in their path as they pass by.

Gravitational waves, first predicted by Albert Einstein's theory of general relativity, are **ripples in the fabric of spacetime** caused by the most energetic events in the cosmos, such as **black hole mergers and neutron star collisions**. Detecting and studying these waves provides invaluable insights into the fundamental nature of the universe.

Scientists sometimes **liken these ripples to the background music of the universe**.



Earlier in 2015, scientists used an experiment called **LIGO to detect gravitational waves** for the first time and showed Einstein was right. But so far, those methods have **only been able to catch waves at high frequencies**

In the latest research, scientists **were searching for waves at much lower frequencies**. These slow ripples can take years or even decades to cycle up and down, and probably come from some of the biggest objects in our universe: supermassive black holes billions of times the mass of our sun.

The scientists **pointed telescopes at dead stars called pulsars**, which send out flashes of radio waves as they spin around in space like lighthouses.

These bursts are so regular that scientists know exactly when the radio waves are supposed to arrive on our planet — “like a perfectly regular clock ticking away far out in space,

The NANOGrav team monitored 68 pulsars across the sky using the **Green Bank Telescope in West Virginia, the Arecibo telescope in Puerto Rico and the Very Large Array in New Mexico**

So far, this method hasn't been able to trace where exactly these low-frequency waves are coming from. Instead, it's revealing the constant hum that is all around us

There are more, or bigger, black hole mergers happening out in space than we thought — or point to other sources of gravitational waves that could challenge our understanding of the universe.

## LIGO

The Laser Interferometer Gravitational-Wave Observatory (LIGO) was designed to open the field of gravitational-wave astrophysics through the direct detection of gravitational waves predicted by Einstein's General Theory of Relativity.

LIGO's multi-kilometer-scale gravitational wave detectors use laser interferometry to measure the minute ripples in space-time caused by passing gravitational waves from cataclysmic cosmic events such as colliding neutron stars or black holes, or by supernovae.

LIGO consists of two widely-separated interferometers within the United States, one in Hanford, Washington, and the other in Livingston, Louisiana, operated in unison to detect gravitational waves.

The LIGO in the US first detected gravitational waves in 2015, which led to a Nobel Prize in Physics in 2017.

These gravitational waves were produced by the merger of two black holes, which were about 29 and 36 times the mass of the Sun, 1.3 billion years ago.

## Gravitational waves

Gravitational waves are ‘ripples’ in space-time caused by some of the most violent and energetic processes in the Universe.

Albert Einstein predicted the existence of gravitational waves in 1916 in his general theory of relativity.

Einstein's mathematics showed that massive accelerating objects (such as neutron stars or black holes orbiting each other) would disrupt space-time in such a way that ‘waves’ of undulating space-time would propagate in all directions away from the source.

These cosmic ripples would travel at the speed of light, carrying with them information about their origins, as well as clues to the nature of gravity itself.

The strongest gravitational waves are produced by cataclysmic events such as colliding black holes, supernovae (massive stars exploding at the end of their lifetimes), and colliding neutron stars.

Other waves are predicted to be caused by the rotation of neutron stars that are not perfect spheres, and possibly even the remnants of gravitational radiation created by the Big Bang.

## WEF ENERGY TRANSITION INDEX 2023

### Why in news?

The World Economic Forum on June 28 ranked India at the 67th place globally on its Energy Transition Index and said it is the only major economy with energy transition momentum accelerating across all dimensions.

Sweden topped the list and was followed by Denmark, Norway, Finland and Switzerland in the top five on the list of 120 countries.

### About

The World Economic Forum (WEF) publishes the Global Energy Transition Index (ETI) under the title “Fostering Effective Energy Transition” to track the global shift to stable, efficient, affordable, renewable energy. The Index measures 115 countries and ranks them based on how successfully they transitioning to renewable energy. It also helps countries in developing energy transformation roadmaps.

### India specific Highlights

The report highlighted India’s achievements in reducing energy and carbon intensity, achieving universal energy access, and managing electricity affordability. India also fared relatively well during the recent energy crisis due to a low share of

natural gas in power generation and increased use of existing capacities. Singapore was the only other major economy showing momentum in sustainability, energy security, and equity.

In its report, the WEF said that while there has been broad progress on clean, sustainable energy, there are emerging challenges to the equity of transition due to countries shifting their focus to energy security.

“This speed of transition is not sufficient to meet the Paris Agreement targets in an inclusive and secure way. The geopolitical and macroeconomic volatilities that prompted the recent global energy crisis shifted countries’ focus to maintaining secure and stable energy supply at the expense of universal affordability and challenged progress observed in the past decade,” WEF said in a statement.

The Paris Agreement, signed 2015 to beat climate change, aims to keep the global temperature rise this century below 2 degrees Celsius, and to further limit the increase to 1.5 degrees Celsius.

Stated energy transition goals	Energy policy priorities
<ul style="list-style-type: none"> <li>→ Reduce emission intensity of GDP by 45% by 2030 from the 2005 level</li> <li>→ Achieve net-zero emissions by 2070</li> <li>→ Achieve 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030</li> </ul>	<ul style="list-style-type: none"> <li>→ Develop low-carbon electricity systems</li> <li>→ Develop an integrated, efficient and inclusive low-carbon transport system</li> <li>→ Promote adaptation in urban design, energy and material efficiency in buildings, and sustainable urbanization</li> </ul>
	<ul style="list-style-type: none"> <li>→ Decouple growth from emissions economy-wide</li> <li>→ Employ CO<sub>2</sub> removal and related engineering solutions</li> </ul>

## ARCTIC OCEAN COULD BE ICE-FREE BY THE 2030S

### Why in the News?

The Arctic Ocean could be ice-free in summer by the 2030s, even if we do a good job of reducing

emissions between now and then. That’s the worrying conclusion of a new study in Nature Communications.

## About

### Blue Ocean Event (BOE)

A Blue Ocean Event (BOE) is probably something you've never heard of, but in just a few years it will be the biggest story that everyone is talking about.

A BOE is when the Arctic Ocean changes from being covered in ice year-round and reflecting most of the sunlight that impacts it back into space to being mostly ice-free blue water for a period of time during the warm season (May through October), which will cause it to absorb most of the sunlight that impacts it.

Once a BOE occurs during a warm season, the Arctic Ocean water will refreeze during the following cold season.

However, since the water will be slightly warmer each year, longer Blue Ocean Events are expected with each passing warm season, causing extensive impacts to the global climate and human habitat.

Blue water, which is dark, absorbs more sunlight than white ice, due to the fact that darker colors naturally absorb more sunlight than lighter colors, a phenomenon known as the "albedo effect."

One problem with predicting when this might occur is that sea ice is notoriously difficult to model because it is influenced by both atmospheric and oceanic circulation as well as the flow of heat between these two parts of the climate system.

### Consequences

There is still plenty of uncertainty around the exact date – about 20 years or so– because of natural chaotic fluctuations in the climate system. But compared to previous research, the new study still brings forward the most likely timing of a blue ocean event by about a decade.

Arctic sea ice is an important component of the climate system. As it dramatically reduces the amount of sunlight absorbed by the ocean, removing this ice is predicted to further accelerate warming, through a process known as positive feedback.

This, in turn, will make the Greenland ice sheet melt faster, which is already a major contributor to-sea level rise.

The loss of sea ice in summer would also mean changes in atmospheric circulation and storm tracks, and fundamental shifts in ocean biological activity.

## CARNIVOROUS ALLIGATOR GAR

### Why in the News?

The discovery of an Alligator Gar fish (*Atractosteus spatula*), an invasive species in Kashmir's Dal Lake has raised concerns. The Lake Conservation and Management Authority (LCMA) and the Department of Fisheries are collaborating to understand the extent of the invasion and its potential impact.

### About Carnivorous alligator gar:

They are known for its crocodile-like head and razor-sharp teeth.

The alligator gar is a close relative of the bowfin species.

It is a ray-finned euryhaline fish and is one of the biggest freshwater fish in North America and the largest species in the 'gar' family.

The alligator gar fish is not an Indian species and normally found in Northern and Central America and also in Mexico.

But in recent years it was also found in some parts of India like Bhopal, Kerala and from the water-bodies of Maharashtra and Kolkata.

IUCN Status - Least Concern

### Why is it a cause of concern?

Being a predator fish and a carnivore, it can eat all types of fishes and therefore poses a threat to native species and to the overall ecosystem.

For example, gar fish grows rapidly and has a life span of 20-30 years.

It would kill all fingerlings of fish species already present in the water body and has a

tendency to destroy natural aquatic life of Dal Lake.

**Threat to Lake Ecosystem:** The lake, which is linked to the livelihood of thousands, has witnessed extreme loss in water quality, mainly because of anthropogenic pressures such as discharge of untreated sewage. Thus, crocodile fish can further aggravate the loss of Lake Habitat.

### Laws for protection from invasive species:

In India, the **Biological Diversity Act 2002** prohibits the presence of any kind of invasive fish species that can be hazardous to natural fish fauna.

### About Dal Lake

It is a lake in Srinagar, the capital of the Union Territory of Jammu and Kashmir (J&K).

It is one of the **world's largest natural lakes** and the second largest lake in J&K.

It is integral to tourism and recreation in Kashmir and is named the "Jewel in the crown of Kashmir" or "**Srinagar's Jewel**".

It is also an important source for commercial

operations in fishing and water plant harvesting.

It covers an area of 18 square kilometres and is part of a natural wetland including its floating gardens. The floating gardens, known as "Raad" in Kashmiri, blossom with lotus flowers during July and August.

Dal Lake is also **popular for the floating market** (known as Raad) where vendors have their own Shikaras and approach tourists.



## KILAUEA VOLCANO ERUPTS ON HAWAII'S BIG ISLAND

The Hawaiian Volcano Observatory (HVO) confirmed the Kilauea volcano's new eruption within the Halema'uma'u crater in the Kilauea Caldera within the Hawai'i Volcano National Park.

### About Kilauea volcano

The Kilauea Volcano is one of the world's most active volcanoes, erupting 38 times so far. It has an elongated dome built of lava eruptions.

The volcano's 1250 meters summit has collapsed forming a caldera i.e., a depression created after partial collapse after an explosive eruption.

The Kilauea is a shield volcano that is a type of volcano that tends to erupt basalt lava that is very fluid in nature.

Mount Kilauea is located near the volcano

Mauna Loa.

The Volcanic gas emissions have increased with sulphur dioxide, along with water vapour and carbon dioxide contributing to a volcanic smog that has created a visible haze.



# KAKHOVKA DAM, UKRAINE

The Kakhovka Dam was a major hydroelectric power plant and reservoir on the Dnieper River in southern Ukraine.

The dam was important for supplying water to the Crimean Peninsula and the Zaporizhzhia nuclear plant.

It was destroyed on June 6th, 2023, in an explosion that caused massive flooding and a humanitarian crisis in the war-torn region.

Ukraine and Russia have blamed each other for the attack, which has escalated the tensions between the two countries.

Crimea is a peninsula in Eastern Europe, on the northern coast of the Black Sea, almost entirely



surrounded by the Black Sea and the smaller Sea of Azov. It came under Russian rule in 2014.

# GLOBAL ANNUAL TO DECADEAL CLIMATE UPDATE

## Why in News?

Recently, the World Meteorological Organization (WMO) issued the Global Annual to Decadal Climate Update.

## Findings

Global temperatures are likely to surge to record levels in the next five years, fuelled by heat-trapping greenhouse gases and a naturally occurring El Niño event.

The annual mean global near-surface temperature for each year between 2023 and 2027 is predicted to be between 1.1°C and 1.8°C higher than the 1850-1900 average.

This is used as a baseline because it was before the emission of greenhouse gases from human and industrial activities.

There is a 66% chance that the annual average near-surface global temperature between 2023 and 2027 will be more than 1.5°C above pre-industrial levels for at least one year.

There is a 98% chance that at least one of the next five years, and the five-year period as a whole, will be the warmest on record.

Arctic warming is disproportionately high.

Compared to the 1991-2020 average, the temperature anomaly is predicted to be more than three times as large as the global mean anomaly when averaged over the next five northern hemisphere extended winters.

Predicted precipitation patterns for the May to September 2023-2027 average, compared to the 1991-2020 average, suggest increased rainfall in the Sahel, northern Europe, Alaska, and northern Siberia, and reduced rainfall for this season over the Amazon and parts of Australia.

## Implications

A warming El Niño is expected to develop in the coming months and this will combine with human-induced climate change to push global temperatures into uncharted territory.

In addition to increasing global temperatures, human-induced greenhouse gases are leading to more ocean heating and acidification, sea ice and glacier melt, sea level rise, and more extreme weather.

This will have far-reaching repercussions for health, food security, water management, and the environment.

## NEW COLLECTIVE QUANTIFIED GOAL ON CLIMATE FINANCE (NCQG)

The Sixth Technical Expert Dialogue (TED 6) of the ad hoc Work Programme on the New Collective Quantified Goal was held at the 58<sup>th</sup> Subsidiary Body Meetings in Bonn, Germany.

### About NCQG

Developing Countries including India are pushing for a much higher climate finance mechanism, named 'New Collective Quantified Goal' (NCQG).

The New Collective Quantified Goal on climate finance will be in trillions of dollars, which will be much higher than the earlier target of \$100 Billion set in the Copenhagen Conference, 2009 (COP-15).

The Developed Countries failed to deliver on the promise. So, The New Collective Quantified Goal (NCQG) on climate finance is expected to be finalised by 2024. It will replace the current climate finance goal of \$100 billion annually from developed countries.

Citing the work of the Intergovernmental Panel on Climate Change (IPCC), India said rich countries are the major contributors to the carbon stock in the atmosphere, clearly underlying the importance of the core principles of the UNFCCC and its Paris Agreement - equity and Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC). So, the COP-27 is currently under process in Sharm-El-Sheikh Egypt.

## INDIA HAS SIMILAR GEOLOGIC HISTORY TO PARTS OF SOUTH AFRICA, AUSTRALIA: STUDY

### Why in News?

India hosts remarkably well-preserved volcanic and sedimentary rocks as old as 3.5 billion years, and has similar geologic history to parts of South Africa and Australia, a study has found.

### About the Study

Researchers examined volcanic and sedimentary rocks from the Daitari greenstone belt in the Singhbhum Craton in east India that were formed approximately 3.5 billion years ago.

Cratons are pieces of ancient continents that formed several billions of years ago. Their study provides a window into how processes within and on the surface of Earth operated in the past.

Greenstones are rock assemblages that are primarily composed of sub-marine volcanic rocks with minor sedimentary rocks. They are the best archives to study early Earth surface processes.

### Findings of the Study

The team conducted detailed field-based

studies and precise Uranium-Lead (U-Pb) radiometric-age dating to evaluate the geology of the ancient greenstone rocks.

It established key geological timelines that illustrate the tectonic evolution of the Daitari greenstones.

The Daitari greenstone belt shares a similar geologic make-up when compared to the greenstones exposed in the Barberton and Nondweni areas of South Africa and those from the Pilbara Craton of north-western Australia.

Sub-marine volcanic eruptions were common between 3.5 and 3.3 billion-years-ago, which are largely preserved as pillowed lava within the greenstones of the Singhbhum, Kaapvaal and Pilbara cratons.

More importantly, the style of volcanism decoded from the silicic rocks, which are rich in silica, provide evidence for explosive sub-marine to sub-aerial settings.

Following silicic volcanism, sedimentary

rocks that comprise sub-marine turbidity current deposits formed upon drowning of the volcanic vent.

This provided us with an age estimate for the sub-marine sedimentary rocks that got deposited approximately 3.5 billion years ago, which was based on precise detrital U-Pb zircon data.

Detrital zircon geochronology analyses the age of zircons deposited within a specific sedimentary unit.

## Significance

Studies of ancient greenstones are important not only to understand the diverse volcanic processes but well-preserved greenstones preserve minor sedimentary rocks that formed under sub-marine settings.

These volcano-sedimentary rocks provide clues related to habitable environments on the young Earth and can be regarded as time capsules to help us better understand the evolutionary tale of the planet in its early stages.

# SALT CAVERN- BASED CRUDE OIL RESERVES

*GS-I Distribution of key natural resources across the world and India*

## Context

Government-owned engineering consultancy firm Engineers India (EIL) is studying the prospects and feasibility of developing salt cavern-based strategic oil reserves in Rajasthan, in line with the government's objective of increasing the country's strategic oil storage capacity.

If the idea comes to fruition, India could get its first salt cavern-based oil storage facility. The country's three existing strategic oil storage facilities — at Mangaluru and Padur in Karnataka, and Visakhapatnam in Andhra Pradesh — are made up of excavated rock caverns.

## Importance of crude oil

Countries build strategic crude oil reserves to mitigate major supply disruptions in the global supply chain.

India, the world's third-largest consumer of crude, depends on imports for more than 85% of its requirement — and strategic petroleum reserves (SPR) could help ensure energy security and availability during global supply shocks and other emergencies.

India's strategic oil reserves come under the Petroleum Ministry's special purpose vehicle Indian Strategic Petroleum Reserve (ISPRL). EIL was instrumental in setting up the country's existing SPR as the

project management consultant.

## Why Salt cavern based reserve?

Salt cavern-based storage, which is considered cheaper and less labour- and cost-intensive than rock caverns, could add a new, much-needed chapter to India's SPR story.

## Salt cavern-based reserves v. rock cavern-based reserves

Unlike underground rock caverns, which are developed through excavation, salt caverns are developed by the process of solution mining, which involves pumping water into geological formations with large salt deposits to dissolve the salt.

After the brine (water with dissolved salt) is pumped out of the formation, the space can be used to store crude oil. The process is simpler, faster, and less cost-intensive than developing excavated rock caverns.

Salt cavern-based oil storage facilities are also naturally well-sealed, and engineered for rapid injection and extraction of oil.

This makes them a more attractive option than storing oil in other geological formations.

The salt that lines the inside of these caverns has extremely low oil absorbency, which

creates a natural impermeable barrier against liquid and gaseous hydrocarbons, making the caverns apt for storage. Also, unlike rock caverns, salt cavern-based storages can be created and operated almost entirely from the surface.

Salt caverns are also used to store liquid fuels and natural gas in various parts of the world. They are also considered suitable for storing compressed air and hydrogen.

## Potential in India for storing crude, petroleum products

Rajasthan, which has the bulk of requisite salt formations in India, is seen as the most conducive for developing salt cavern-based strategic storage facilities.

The presence of a refinery in Barmer and crude oil pipelines in Rajasthan makes the infrastructure conducive for building strategic oil reserves.

## Challenges to build Salt cavern reserves in India

Till now, no Indian company, including EIL, had the requisite technical know-how to build salt cavern-based strategic hydrocarbon storage.

This gap in access to technology has been bridged by EIL's recent partnership with Germany's DEEP.KBB GmbH — a company that specializes in cavern storage and solution



## OPERATING A SALT CAVERN

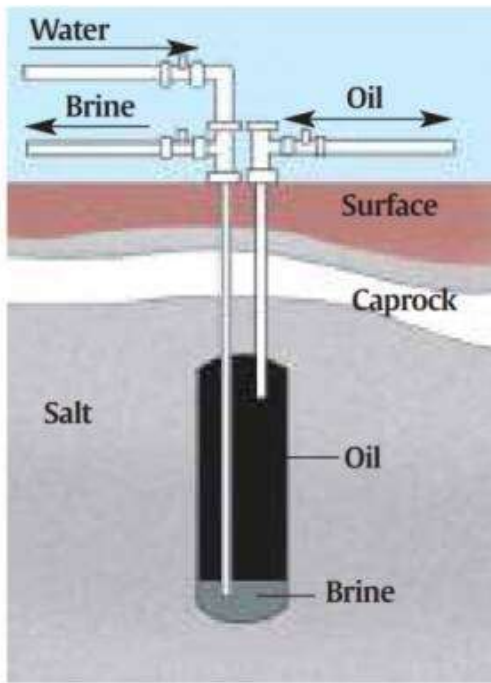


Illustration based on MIT Environmental Solutions Initiative report, August 2020

**CRUDE OIL**, natural gas, or other petroleum substances that might be stored in the reserve are extracted by pumping brine into the cavern. The petroleum substance has a lower density, and is pushed out.

**TO ADD** more petroleum substance to the reserve, the requisite volume of brine is pumped out, creating the required space.

**THIS OPERATION** of extraction and replenishment is done from the surface, usually through two pipeline systems — one each to the residual brine at the bottom of the cavern and the stored hydrocarbon. Since their densities differ, the brine does not mix with the stored substance.

**A SURFACE** brine pond is usually maintained for use in operating the cavern. The brine can be reused repeatedly.

mining technology.

### Strategic petroleum reserves programme in India

India's strategic oil reserves are part of the effort to build sufficient emergency stockpiles on the lines of the reserves that the US and its Western allies set up after the first oil crisis of the 1970s. The three existing rock cavern-based facilities were built during the first phase of the programme.

Crude oil from the reserves are to be released by an empowered committee set up by the government, in the event of supply disruptions due to a natural calamity or

an unforeseen global event leading to an abnormal increase in prices.

The International Energy Agency (IEA), a Paris-based autonomous intergovernmental organisation in which India is an 'Association' country, recommends that all countries should hold an emergency oil stockpile sufficient to provide 90 days of import protection.

In India, apart from the SPR that are sufficient to meet 9.5 days of oil requirement, the oil marketing companies (OMCs) have storage facilities for crude oil and petroleum products for 64.5 days — which means there is sufficient storage to meet around 74 days of the

country's petroleum demand.

India has also decided to commercialise its strategic petroleum reserves, as part of which the Abu Dhabi National Oil Company (ADNOC) stored about 0.8 million tonnes of crude oil in the Mangaluru strategic reserve. In the second phase of the programme, the government wants to develop strategic reserves through public-private partnerships so as to reduce government spending and exploit the commercial potential of the reserves.



# SCIENCE & TECHNOLOGY

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## US-CHINA CHIPS WAR

### Context:

The US-China chips war has prompted India to position itself as a player in the semiconductor technology field through a significant partnership with the US.

### What is the US-China chips war?

The US-China chips war revolves around the rivalry between the two economic powers for dominance in semiconductor technology.

The US has implemented restrictions to prevent China from gaining a technological advantage, while also investing in domestic chip manufacturing.

China, on the other hand, aims to achieve self-sufficiency in semiconductors through its “Made in China 2025” plan.

The war has disrupted global semiconductor supply chains and led to a shift in alliances and trade patterns. In this war, Semiconductors have emerged as the ‘new oil’

### What are Semiconductors?

A semiconductor is a material that has electrical conductivity between that of a conductor and an insulator. Semiconductors are used to create electronic circuits, such as transistors and diodes, which control the flow of electric current.

They are commonly made from materials like silicon or germanium and are essential for various applications, including computers, smartphones, Integrated Circuits, defence systems, and AI

### India’s initiatives:

Production-linked incentive (PLI) scheme for the semiconductor industry

Three entities (Vedanta-Foxconn, international consortium ISMC and Singapore-based IGSS Ventures) that had applied to build the chips

Semicon India Programme: Launched in 2021 with an outlay of Rs 76,000 crore, the programme seeks to support the development of the semiconductors and the display manufacturing ecosystem in India.

Fiscal support for a design-linked initiative (DLI) scheme to drive global and domestic investment related to design software, IP rights etc.

### Global Initiatives for Semiconductors:

Semiconductor friend-shoring among the Quad members by USA, to building “resilient, diverse and secure supply chains of critical and emerging technologies”.

US-led “Chip 4 Alliance” with Japan, South Korea and Taiwan to restrict Chinese access to chip tech.

Taiwan produces over 60% of the world’s semiconductors and over 90% of the most advanced ones.

“Made in China 2025” plan: to get self-sufficiency in semiconductor

### Challenges for India:

India is currently at least two decades behind in chip manufacturing

It lacks the necessary infrastructure, uninterrupted power and water supply, and a skilled workforce.

There is a need for the development of a comprehensive chip ecosystem and ancillary industries in India.

## ARTEMIS ACCORD

### CONTEXT:

On June 21, India became the 27th signatory to the Artemis Accords, a set of non-binding guidelines that underpin the Artemis programme,

a U.S.-led project to return humans to the moon permanently.

### Why do the Accords matter?

The Artemis programme includes plans for

a base on the lunar surface, multiple spacecraft to ferry humans and cargo, an orbiting space station, and a constellation of satellites to help with navigation and communication.

The first Artemis crewed mission to the moon's surface is likely in 2026. The programme resembles a Chinese-Russian plan for an 'International Lunar Research Station'.

With Russia reeling under sanctions, China has taken the lead on the project, outlining similar plans for a permanent base and a lunar satellite constellation.

For leaders in the U.S. and China, lunar exploration embodies all that is good about their countries even as they are locked in a bitter rivalry.

Leaders are also betting that the incredible challenges of lunar exploration will spur technological innovation. A sign of power in international politics is the ability to set norms and build multinational collaborations.

The Accords support an America-friendly interpretation of space law. In return, member states get to participate in the Artemis programme, which can bring prestige and technological benefits.

## Where do the Accords fit in space law?

Modern space law is erected on four international agreements that cover issues like the peaceful use of space, registration, and liability.

They were struck between 1967 and 1976, at the time of the first Space Race and Cold War detente. The Accords' principles are consonant with these agreements.

A fifth treaty, the Moon Agreement, was introduced in 1979 but neither the U.S. nor the Soviet Union signed it. India signed it but didn't ratify it.

One provision in the Artemis Accords allows actors to extract and utilise space resources.

This could be at odds with the Moon Agreement, which asks for gains from commercial exploitation of lunar resources to be distributed.

This has not stopped countries like Australia and France which previously signed the Moon Agreement, from becoming Artemis signatories.

In reality, the provisions of the Accords and the Moon Agreement are vague enough for lawyers to play according to the rules of both.

Also, even if the Artemis programme succeeds and private enterprises set up settlements on the Moon, resource extraction will likely be restricted to using the lunar soil to build habitats and lunar ice for sustaining life.

## Why didn't India sign the Accords earlier?

The Artemis Accords were drafted in 2020, just as India was opening up its own space sector to private players.

While being a signatory to the Moon Agreement may have initially given India pause, the cases of Australia and France are reassuring. India's own attitude has also evolved, with its new space policy allowing private players to mine any "space resource".

There is also a noticeable shift in India's diplomatic practice.

Previously, diplomats in Delhi were likely concerned that the Accords are an informal set of norms rather than a legally-binding instrument.

India has historically preferred the latter because it believes laws foster better compliance. That India has now accepted a set of U.S.-led norms suggests a change in thinking.

Furthermore, the dramatic developments of the last three years have made it clear that divisions between the U.S. and China are too deep for them to agree on a complex new international law on the Moon until their ties improve.

Finally, ties between India and the U.S. have been on an upswing, and there is less hesitation in Delhi about joining an America-inspired international effort.

## What must India do?

Signing the Artemis Accords alone has no financial implications for India but if the

country wants to be a major player in the Artemis programme, ISRO will need a significant hike in its annual budget, which stands at about ₹12,500 crore this year.

At present, ISRO's lunar exploration programme is impressive but modest. Its Chandrayaan-3 mission is scheduled to make India's first soft landing on the moon in the next few weeks.

It may also take three years or more before India independently sends humans into space as part of its Gaganyaan project.

India must overcome domestic resistance to collaboration with other space agencies, enable its private sector to work with other Artemis members, and develop legislation that encourages space activities.

## FIBONACCI SPIRALS

A new study, based on 407-million-year-old fossils challenges the belief that Fibonacci spirals represent an ancient and highly conserved feature, dating back to the earliest stages of plant evolution and persisting in their present forms.

In mathematics, the Fibonacci sequence is a sequence in which each number is the sum of the two preceding ones. Numbers that are part of the Fibonacci sequence are known as Fibonacci numbers.

Fibonacci spirals occur frequently in nature and can be seen in plant leaves, animal shells and

even in the double helix of our DNA. In most cases, these spirals relate to the Fibonacci sequence. *Fibonacci sequence is a set of numbers where each is the sum of the two numbers that precede it (1, 1, 2, 3, 5, 8, 13, 21 and so on).* These patterns are particularly widespread in plants and can even be recognised with the naked eye.

Due to their frequency in living plant species, it has long been thought that Fibonacci spirals were ancient and highly conserved in all plants.

**Notable examples:** Pinecones, leaves, and animal shells exhibit Fibonacci spirals.

## CHANDRAYAAN 3

### Why in news?

The Indian Space Research Organisation's (ISRO) Chandrayaan-3 has reached the Satish Dhawan Space Centre at Sriharikota ahead of its launch planned for July, according to reports.

### About

Chandrayaan-3 is a follow-on mission to Chandrayaan-2 **to demonstrate end-to-end capability in safe landing and roving** on the lunar surface.

It consists of **Lander and Rover configuration**. The launcher identified for Chandrayaan-3 is GSLV-Mk3 It will be launched by **LVM3 from SDSC SHAR, Sriharikota**.

The propulsion module will carry the lander and rover configuration till 100 km lunar orbit.

The propulsion module has **Spectro-polarimetry of Habitable Planet Earth (SHAPE) payload** to study the spectral and Polari metric measurements of Earth from the lunar orbit.

Chandrayaan-3 consists of an indigenous Lander module (LM), Propulsion module (PM) and a Rover with an objective of developing and demonstrating new technologies required for Inter planetary missions.

The Lander will have the capability to **soft land at a specified lunar site** and deploy the Rover which will carry out **in-situ chemical analysis of the lunar surface** during the course of its mobility.

The Lander and the Rover have scientific payloads to carry out experiments on the lunar surface.

The mission objectives of Chandrayaan-3 are:

To demonstrate Safe and Soft Landing on Lunar Surface

To demonstrate Rover roving on the moon and

To conduct in-situ scientific experiments.

### Lander payloads:

**Chandra's Surface Thermophysical Experiment (ChaSTE)**

to measure the thermal conductivity and temperature;

**Instrument for Lunar Seismic Activity (ILSA)** for measuring the seismicity around the landing site;

**Langmuir Probe (LP)** to estimate the plasma density and its variations.



A **passive Laser Retroreflector Array** from NASA is accommodated for lunar laser ranging studies.

### Rover payloads:

**Alpha Particle X-ray Spectrometer (APXS)** and **Laser Induced Breakdown Spectroscopy (LIBS)** for deriving the **elemental composition in the vicinity of landing site.**

## KERALA FIBRE OPTICAL NETWORK (KFON)

### Why in news?

The Kerala government officially launched KFON, a flagship project aimed at reducing the digital divide and promoting e-governance.

### About

It is an optical fibre cable network of 30,000 km, with 375 Points-of-Presence across the state.

### Objective

To provide Internet connection to **BPL families, government offices, hospitals and schools**. About **12 lakhs Below Poverty Line (BPL) families** will be given free Internet connection. About **2000 Wi-Fi hotspots** across the state will help connect users in schools, hospitals, offices and houses.

Each household will receive **1.5 GB** of data per day at 15 Mbps speed.

Bridging Digital gap and ensure universal Internet access

### Implementation

KFON is a **joint venture of Kerala State Electricity Board (KSEB) and Kerala State IIT Infrastructure Limited**

A consortium led by Central PSU Bharat Electronics Limited took up the project

Consultant - Price Waterhouse Coopers

The **infrastructure asset** shall be owned by KSEBL,

**Operations and Maintenance** - Kerala State Information Technology Infrastructure Ltd (KSITIL)

Bharat Electronics (BEL) has taken the tasks of rolling the optical fibre cable network, providing connectivity to government institutions and setting

up network point of presence locations.

The government has said that KFON will be provided by local ISP/TSP/cable TV providers.

### Internet access as a right

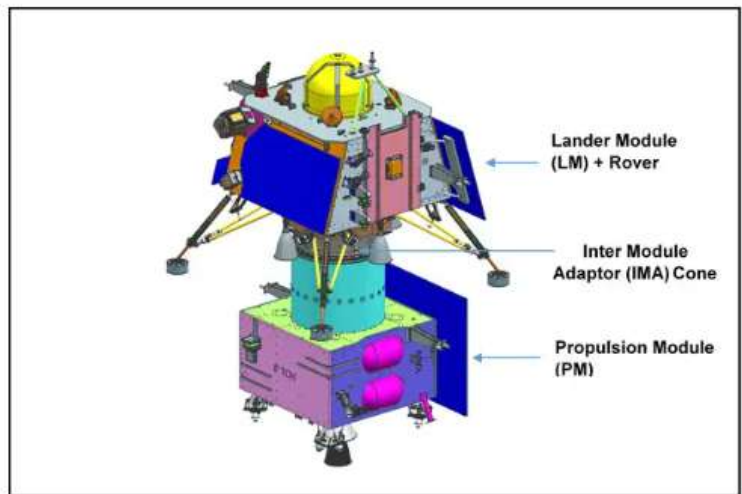
In 2016, United Nation passed a resolution recognising Internet access as a basic human right. Kerala government, which was the first state to declare the right to the internet as a basic right,

### Significance

Digitisation of government services

Reducing digital divide

Digital literacy



**Chandrayaan-3 – Integrated Module**

Capacity building

Driver of economic growth

## SHENZHOU-16 MANNED SPACESHIP

### Why in news?

China successfully launched the Shenzhou-16 manned spaceship, sending three astronauts, including the first civilian to its space station combination for a five-month mission.

### About

Shenzhou 16 is a Chinese spaceflight to the Tiangong space station, launched on 30 May 2023 on board a Shenzhou spacecraft.

It carries two People's Liberation Army Astronaut Corps (PLAAC) taikonauts and a payload specialist from Beihang University.

The mission is the eleventh crewed and sixteenth flight overall of the Shenzhou program.

### Tiangong space station

Tiangong space station which translates as "Heavenly Palace" is China's permanent space station.

China had previously launched two temporary trial space stations, named as Tiangong-1 and Tiangong-2.

Operated by China Manned Space Agency (CMSA), the Tiangong space station was built by China after the USA barred NASA from

working with the Asian country, citing a high risk of espionage. The permanently inhabited space station's first module entered orbit in 2021 and two more modules were added to it in the following years.

The Tiangong space station, expected to become the sole in-orbit outpost for scientific research after the end of operations for the International Space Station in 2030, is China's ambitious project to achieve its space dreams

The Tiangong space station has three modules namely:

Tianhe: the core module launched in 2021

Wentian: science module 1, launched in 2022

Mengtian: science module 2, also launched in 2022

Tiangong space station is planned in such a way that it shares its orbit with the Xuntian space telescope in order to facilitate astronauts to repair and upgrade the telescope easily.

China became only the third country in history to have put both astronauts into space and to build a space station, after the Soviet Union and the US.

## AGNI PRIME

### Why in news?

New Generation Ballistic Missile 'Agni Prime' was successfully flight-tested by Defence Research and Development Organisation (DRDO) from Dr APJ Abdul Kalam Island off the coast of Odisha on June 07, 2023. During the flight test, all objectives were successfully demonstrated.

### About

This was the first pre-induction night launch conducted by the users after three successful developmental trials of the missile, validating the accuracy and reliability of the system.

Agni-P or Agni-Prime is a **new generation nuclear-capable medium-range ballistic missile (MRBM)** developed by the DRDO that incorporates technological advances from Agni-IV and Agni-V and is considered a **successor for Agni-I and Agni-II missiles** in the operational service of the Strategic Forces Command.

Agni-Prime, with a **strike range of 1,000 to 2,000 km**, has significant upgrades, which include composite motor casing, **manoeuvrable reentry vehicle (MaRV)**, improved propellants,

and navigation and guidance systems.

It is a **two-stage, surface-to-surface, road-mobile and solid-fueled missile** which is transported by a truck and launched **via a canister**, like the country's first intercontinental ballistic missile (ICBM), Agni-V (over 5,000 km). It is a ballistic missile **with dual redundant navigation and guidance system**.

Along with Agni-V, Agni-P will provide India with stronger deterrence against countries such as China and Pakistan. While Agni-V brings all of China within its strike range, Agni-P seems to have been developed to counter Pakistan's forces.

Integrated Guided Missile Development Programme was aimed at making India self-sufficient in missile technology. The programme has five missiles P-A-T-N-A: Prithvi, Agni, Trishul, Nag, and Akash.

Agni-P is the sixth missile in the Agni (missile) series of ballistic missiles. It is a family of medium to intercontinental range ballistic missiles developed by India, named after one of the five elements of nature.

## SAFE HARBOR

### Why in news?

Any regulation of artificial intelligence (AI) in India would be done through the "prism of user harm", Minister of State for Electronics and Information Technology Rajeev Chandrasekhar said on Friday. He expressed scepticism about AI applications in their current form replacing jobs at a significant level.

The Minister blamed the Congress-led UPA for giving a free pass to big tech companies by introducing the 'safe harbour' clause into the IT Act in 2008.

### Safe Harbor

One of the most debated issues is 'safe harbour for social media intermediaries.' The 'safe harbour' concept affects social media,

e-commerce and AI-based platforms.

According to the safe harbour principle, **an online platform** such as Facebook or Twitter **cannot be held accountable** for the content posted on them by users.

The safe harbour provision has been given under **Section 79 of the IT Act 2000**. It states that "**an intermediary shall not be liable for any third-party information, data, or communication link made available or hosted by him**".

Conditions for safe harbour

Section 79 states that **safe harbour wouldn't be given** if the intermediary "**fails to expeditiously take down a post or remove a particular content** even after the government flags that the information is being used to commit something



unlawful.

The government believes there should be no free pass to social media companies and ‘safe harbour’ cannot be an excuse to let harmful posts remain.

Experts say safe harbour has often led to a **lack of content moderation, inadequate fact-checking, and content violations on platforms.**

### The present status of ‘Safe Harbor’

Last year, the government had mandated, through the **IT Rules of 2021**, that social media

platforms must appoint a **Chief Compliance Officer (CCO)**, **Resident Grievance Officer (RGO)**, and **Nodal Contact Person**.

Under the new Digital India law, each intermediary category will be subject to new regulations with a heavy focus on fact-checking to prevent misinformation or misuse of data.

These platforms will now be held accountable for any content violations or cybercrimes that occur on their websites.

That **extends to Deep Fakes** and Doxxing.

## TELEGRAM BOTS

### Why in news?

Recently, several Indian media reported that India’s COVID-19 vaccine booking portal, CoWIN, was compromised, and sensitive personal information of thousands of users was leaked on the Telegram social messaging app.

It was claimed that a Telegram bot was revealing sensitive data of the users when inquired about an individual’s phone number. The bot leaked the name, Aadhaar number, PAN number, passport number, date of birth, location, gender, and the institute from where they got vaccinated.

### About

#### What is a bot?

A bot, short for robot, is a software application programmed to perform tasks through Robotic Process Automation, or RPA.

Bots work by automatically going through a set of instructions, and they carry out tasks and processes much faster, more accurately, and at a higher volume than it would otherwise take humans.

On Telegram, These bots can support “any kind of task or service,” with some popular functions including delivering answers to users’ FAQs, converting certain file types into others, or setting reminders for users.

However, of late, there has been sharp in increase of mishandling bots and primarily used

to run scams, or exfiltrate personal data.

### Who can create bots on Telegram?

Any developer with some skills in computer programming or a third-party service provider can create a Telegram bot using the platform’s bot API.

The API gives the tools and framework required to integrate code for the bot within the platform. The platform assists the creation of bots through “Botfather” a virtual user designed to be the central development tool for Telegram bots.

### What is the use of bots on Telegram?

Bots are usually used in professional areas for smart communication and pulling information from defined databases.

Users can send commands to bots that they respond to with relevant information or perform tasks they are designed to do.

For example, if a user does not wish to open their email app to check their messages, they can use a bot to check their email within the Telegram app. Users can also authorise bots to respond to emails from the Telegram app.

### Can a bot threaten privacy of users?

Apparently yes, One of the main concerns raised about chatbots is the collection of personal information.

Many chatbots collect user data, including

their conversations, personal preferences, and location.

Though this data is used to personalise the chatbot responses and improve the user experience, there have been many instances where it is used for scams and identity thefts, spread malware and launch cyberattacks.

### Has this happened before?

Twice there have been claims of CoWIN breach. The first instance was in June 2021, where a few had claimed the portal had been hacked resulting in the sale of data relating to 150 million Indians.

The Indian government denied that this had happened. Then in January last year, when similar reports of a data breach emerged, the chief of the National Health Authority, Ram Sewak Sharma, responded saying the database was “safe and secure”.

### Previous Data leaks in India

- Air India data breach
- CAT data breach
- Upstox data leak
- Police exam data spill (2019) and Cyberabad data theft (2023)
- Covid-19 information breach incident
- Domino's India data theft
- Justpay data leak

### About the CoWIN (Covid Vaccine Intelligence Network) portal

CoWIN is the Indian government's cloud-based IT solution for planning, implementation, monitoring, and evaluation of Covid-19 vaccination in India.

This allows the system to monitor the utilization, wastage, coverage of Covid-19 vaccination at national, state, district and sub-

district level.

The platform is owned by the Ministry of Health and Family Welfare and was earlier the platform used for conducting Pulse Polio and other crucial immunization programmes across the country.

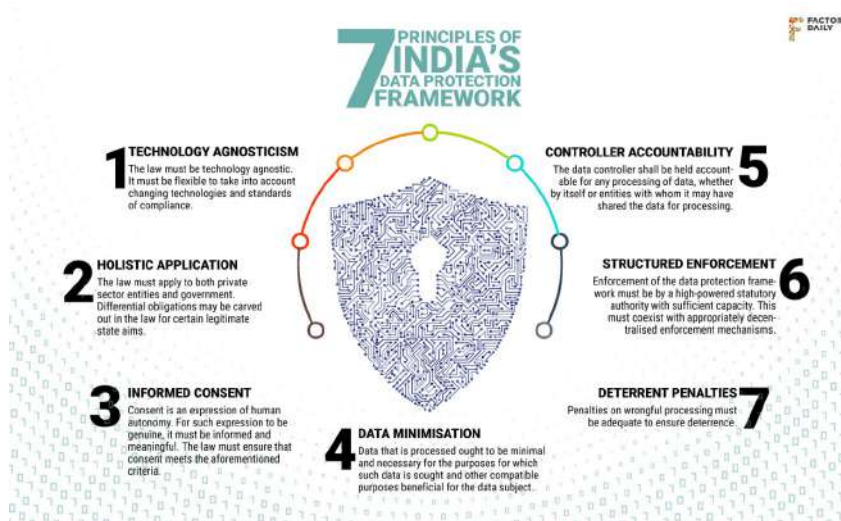
CoWIN is essentially an extension of eVIN (Electronic Vaccine Intelligence Network).

### India's Data Protection Framework The Draft Digital Personal Data Protection Bill, 2022

The Digital Personal Data Protection Bill 2022 introduces a new framework for personal data protection, making it paramount to comprehend and understand its applicability and functions

The Government of India sees this released bill as one of the parts of its larger vision of a digital economy, this vision include a comprehensive “Digital India Act” which would replace the existing IT act.

### Aspects of proposed data bill



# GEMCOVAC OM

## Why in news?

In June 2023, the Drugs Controller General of India (DCGI) approved an mRNA COVID-19 booster vaccine called GEMCOVAC-OM manufactured by Pune-based Gennova Biopharmaceuticals. In this article, you can read more about the new vaccine for the IAS exam science and technology, as well as health segments

## About

India's **first mRNA vaccine** has been developed using the indigenous platform technology by Gennova, with funding support from **Department of Biotechnology (DBT) and Biotechnology Industry Research Assistance Council (BIRAC)**. A few days ago this vaccine got the nod from the office of the Drug Control General of India (DCGI) for Emergency Use Authorization (EUA).

GEMCOVAC® -OM is a **thermostable vaccine** and does not require ultra-cold chain infrastructure used for other approved mRNA- based vaccines.

This innovation makes it easy for last mile deployment in our country. The existing supply chain infrastructure is sufficient to deploy this vaccine. Its unique feature is that this vaccine can be **administered without a needle injection**.

The GEMCOVAC® -OM vaccine is delivered **intra-dermally using a needle-free injection device system** and in study participants it generated significantly higher immune responses. The clinical outcome demonstrates the need for variant-specific vaccines for desired immune response.

## mRNA vaccines

mRNA vaccines are a type of vaccine that use messenger RNA (mRNA) molecules to provide instructions to our cells on how to produce a harmless piece of the target virus or pathogen. These vaccines work by introducing a small piece of mRNA that codes for a specific protein found on the surface of the virus or pathogen.

## DCGI

The Drug Controller General of India (DCGI) is a key regulatory authority responsible for the regulation and control of pharmaceuticals, medical devices, and cosmetics in India. It operates under the Central Drugs Standard Control Organization (CDSCO), which is a division of the Ministry of Health and Family Welfare, Government of India.

The DCGI plays a crucial role in ensuring the safety, efficacy, and quality of drugs and healthcare products available in the Indian market.

## EUA

Emergency Use Authorization (EUA) is a regulatory mechanism that allows the expedited approval and use of drugs, vaccines, or medical products during public health emergencies, such as pandemics. In India, the authority responsible for granting Emergency Use Authorization is the Drug Controller General of India (DCGI).

## Other Initiatives

A number of key initiatives are currently being implemented to promote basic and translational vaccine research, including the (i) Indo-US Vaccine Action Programme, (ii) National Biopharma Mission, (iii) Ind-CEPI Mission, and (iv) Mission COVID Suraksha, which was launched as part of Atmanirbhar Bharat 3.0, with the goal of bringing safe, efficacious, affordable and accessible indigenous COVID 19 vaccines to the citizens of the country at the earliest.

## National Biopharma Mission

The Mission Programme is a Pan-India Programme with the main aim of making India a hub for design and development of novel, affordable and effective biopharmaceutical products and solutions. This Program would aid in enhancing India's innovation research and product development capabilities, especially by focusing on development of vaccines, biologics and medical devices for combating public health concerns.

## Mission COVID suraksha

The Mission has been intended to be a

National Mission with a focus on bringing to the citizens of the country a safe, efficacious, affordable and accessible COVID-19 Vaccine, at the earliest with a focus on Atma Nirbhar Bharat. The goal of the Mission is to accelerate the development of at least 5-6 COVID-19 vaccine candidates and ensure that some of these are brought closer to licensure and introduction in the market for consideration of regulatory authorities and for introduction in public health systems.

## Indo – US Vaccine Action Programme

The Indo-US Vaccine Action Programme (VAP), is an internationally recognized flagship programme of the Department of Biotechnology, being implemented jointly with the National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH), USA, since 1987.

VAP is a unique bilateral programme with an aim to support novel and innovative vaccine related research, accelerated development of candidate vaccines for which earlier leads are available, research of basic & applied nature to improve our current understanding of vaccine science to strengthen the scientific basis for future vaccine

design and to strengthen vaccine development ecosystem.

## Ind- CEPI mission

‘India Centric Epidemic Preparedness through Rapid Vaccine Development: Supporting Indian Vaccine Development Aligned with the Global Initiative of the Coalition for Epidemic Preparedness Innovations (CEPI) -- The Mission aims at strengthening development of vaccines against emerging infectious diseases, up to Phase II testing and enhance inter-ministerial co-ordination for accelerating vaccine development.

The Ind-CEPI targets are selected in alignment with R&D Blueprint of the World Health Organisation (WHO), whereby, priority pathogens are selected based on public health impact, risk of outbreak and feasibility of development

The Mission is focused on strengthening infrastructure for vaccine development through academia-industry interface, enabling skill development and capacity building activities and supporting development of surveillance frameworks for use of new vaccines

# LEPTOSPIROSIS

## Why in the News?

Leptospirosis has emerged as an important infectious disease in the world which tends to have large outbreaks after heavy rainfall or flooding.

## About

It is a potentially fatal **zoonotic bacterial disease**.

caused by - bacterium called **Leptospira interrogans, or Leptospira**.

It is more prevalent in warm, humid countries and both urban and rural areas.

It is a **contagious disease** in animals but is occasionally transmitted to humans in certain environmental conditions.

The carriers of the disease can be either wild or domestic animals, including rodents, cattle,

pigs, and dogs.

The cycle of disease transmission begins with the shedding of *Leptospira*, usually in the urine of infected animals.

According to the U.S. Centres for Disease Control and Prevention, infected animals can continue to excrete the bacteria into their surroundings for a few months, but sometimes up to several years.

## Which people are at risk?

Humans become part of the cycle when they come in direct contact with this urine or indirectly, through soil and water that contain leptospira bacteria. A person is more likely to contract leptospirosis if they have cuts or abrasions on their skin.

The disease is also considered an occupational

hazard for people working in agricultural settings, with animals, or in sanitary services that bring them into contact with contaminated water.

Recreational activities in contaminated lakes and rivers are also reported to increase the risk of leptospirosis.

### What are the symptoms of leptospirosis?

The severity of a leptospirosis infection ranges from a mild flu-like illness to being life-threatening.

The infection can affect many organs, reflecting the systemic nature of the disease. This is also why the signs and symptoms of leptospirosis

are often mistaken for other diseases.

In milder cases, patients could experience a sudden onset of fever, chills, and headache – or no symptoms at all. But in severe cases, the disease can be characterized by the dysfunction of multiple organs, including the liver, kidneys, lungs, and the brain.

Animals exhibit a variety of clinical symptoms and indications. In cattle and pigs, the disease can potentially cause reproductive failure, stillbirths, and weak calves or piglets. Dogs experience a range of symptoms, including fever, jaundice, vomiting, diarrhea, renal failure, and even death.

**Treatment** : can be treated using Antibiotics.

## CAPTAGON PILL

### Why in the News?

Recently, after the Arab League reinstating Syria as its member, the discussions on the trade of Captagon pills have taken the centre-stage once again.

### About Captagon pill

It is a highly addictive **amphetamine-type drug**, which is produced mainly in Syria.

The original Captagon contained fenetylline, a synthetic drug of the phenethylamine family to which amphetamine also belongs.

It was commercially sold in several countries until the 1980s and was banned due to fears of its highly addictive nature.

### What do amphetamine-based drugs do?

It stimulates the central nervous system, providing a boost of energy, enhance someone's focus, let someone stay awake for longer periods of time, and produce a feeling of euphoria.

These type drugs usually stay in the blood for around 36 hours.

When taken orally, their peak effect occurs one to three hours after consumption, and effects last for as long as seven to 12 hours.

### What are the side effects?

They can cause loss of appetite and weight, heart problems such as fast heart rate, irregular heartbeat, increased blood pressure, and heart attack, which can lead to death.

They can also cause high body temperature, skin flushing, memory loss, problems thinking clearly, and stroke.

## CHOLEDERM

### Why in the News?

Drugs Controller approves first indigenously developed animal-derived tissue engineering scaffold for skin wounds healing.

### About

An advanced wound care product developed by the Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), named Cholederm, has won the approval of the Central Drugs Standard Control Organisation (CDSCO) as a Class D medical device.

## About Cholederm:

It is a wound healing material derived from the extracellular matrix of the de-cellularised gall bladder of pigs and tissue engineered as **membrane forms of a scaffold**.

It healed different types of skin wounds including burn and diabetic wounds in rats, rabbits or dogs etc. faster than similar products currently available in the market

It is the **first indigenously developed** product to meet all regulatory requirements.

The scaffold modulated the scarring reactions in subcutaneous, skeletal-muscle and cardiac tissues.

## Key facts about CDSCO

It is the Central Drug Authority for discharging functions assigned to the Central Government under the Drugs and Cosmetics Act of 1940.

It works under the Ministry of Health & Family Welfare.

Under the Drugs and Cosmetics Act, CDSCO is responsible for -

- Approval of Drugs.
- Conduct Clinical Trials.
- Laying down the standards for Drugs.
- Control over the quality of imported Drugs in the country.

Along with state regulators, it is jointly responsible for the grant of licences to certain specialised categories of critical Drugs such as vaccines and sera, etc.

Drugs Controller General of India (DCGI): DCGI is the head of the department of the CDSCO of the Government of India responsible for approval of licences of specified categories of drugs such as blood and blood products, IV fluids, vaccines and sera in India.

DCGI also sets standards for the manufacturing, sales, import, and distribution of drugs in India.

# MITOCHONDRIAL DONATION TREATMENT

## Why in News?

Britain's fertility regulator confirmed the births of the U.K.'s first babies created using an experimental technique combining DNA from three people, an effort to prevent the children from inheriting rare genetic diseases.

In 2015, the U.K. became the first country to adopt legislation regulating methods to help prevent women with faulty mitochondria — the energy source in a cell — from passing defects on to their babies. The world's first baby born using the technique was reported in the U.S. in 2016.

## What are roles of Mitochondria?

Mitochondria are basically the powerhouses of the cells, they generate the energy, and thus are also responsible for cell function in the human body. Certain defects might occur impacting on the way the mitochondria produces energy for the cells (Specially in the 'energy-hungry' tissues of the brain, nerves, muscles, kidneys, heart, liver), and thereby impacting cell function.

The diseases that arise out of such mitochondrial mutations are called mitochondrial diseases. When the mitochondria are impaired and do not produce sufficient energy, that affects how the organs function, leading to a broad assortment of symptoms across the body, including brain damage, organ failure and muscle wastage.

## The Scientific Process

Mitochondrial diseases are only passed on by the mother, and research has been attempting to find a way out of protecting the infant from inheriting the disease. Here, through an advanced In Vitro Fertilisation technique developed and refined by the Newcastle Fertility Clinic, the baby's biological father's sperm was used to fertilise the eggs from the biological mother, who has a mitochondrial disease, and a third, female donor with clear mitochondria, separately.

Then, the nuclear genetic material from the donor's egg is removed and replaced with the genetic material from the biological parents'.

The final product – the egg – which has the genetic material (DNA) from the parents, and the mitochondria from the female donor, is implanted in the uterus, and carried to full term

to yield a baby who will be free from the mother's mitochondrial disease. This process is termed Mitochondrial Donation Treatment (MDT).

## NEW TECHNIQUE FOR RADIOMETRIC DATING USING CALCIUM-41

### Why in News?

Scientists have suggested using Calcium-41 for Radiometric Dating as an alternative to Carbon-14 for determining the age of fossilized bones and rocks.

They have suggested a technique called **Atom-Trap Trace Analysis (ATTA)** as a solution, because ATTA is sensitive enough to spot Calcium-41, which is a rare isotope.

### Calcium-41

Calcium-41, is a rare long-lived radioisotope of Calcium with a half-life of 99,400 years.. It is produced when cosmic rays from space smash into calcium atoms in the soil, and is found in the earth's crust, opening the door to dating fossilized bones and rock.

### How does ATTA work?

A sample is vaporised in an oven. The atoms in the vapour are laser-cooled and loaded into a cage made of light and magnetic fields.

We know that in an atom, an electron in one orbital can transition to the next if it's given a specific amount of energy; then it jumps back by releasing that energy. In ATTA, a laser's frequency is tuned such that it imparts the same energy as required for an electron transition in calcium-41. The electrons absorb and release this energy, revealing the presence of their atoms.

### How Carbon-14 is used to find the

### age of or fossilized things?

When an organic entity is alive, its body keeps absorbing and losing carbon-14 atoms. When it dies, this process stops and the extant carbon-14 starts to decay away. Using the difference between the relative abundance of these atoms in the body and the number that should have been there, researchers can estimate when the entity died.

### Limitations with Carbon-14

Carbon-14 is an unstable and weakly radioactive isotope of carbon. It has a half-life of 5,700 years and is used to estimate the age of carbon-based materials.

Carbon dating using Carbon-14 is limited to objects up to 50,000 years old due to carbon-14's 5,700-year half-life.

A significant early issue with carbon dating was to detect carbon-14 atoms, which occur once in around 10<sup>12</sup> carbon atoms. Calcium-41 is rarer, occurring once in around 10<sup>15</sup> calcium atoms.

### Earth-science application

The researchers are currently exploring an earth-science application. In warmer climate, glaciers retreat and allow rock below to accumulate calcium-41. In colder climate, glaciers advance and block the calcium-41 from reaching the rock.

This way, scientists hope to use ATTA to study how long some rock has been covered by ice.

## FAST RADIO BURST (FRB)

### Context:

Astronomers have reported a fast radio burst (FRB) whose characteristics are different from almost all other FRBs previously detected,

except one.

The latest FRB (Named FRB 20190520B), unlike many other FRBs, emits frequent, repeating bursts of radio waves. Only one FRB has been

previously observed to behave this way.

### What are FRBs?

FRBs are bright flashes of light that appear for a few milliseconds and then vanish.

The first FRB was discovered in 2007. Since then 140 more were discovered until June 2021.

### How are they produced?

The astronomers have suggested that the candidates for the sources of FRBs are the super-

dense neutron stars left over after a supernova, or magnetars (neutron stars with ultra-strong magnetic fields).

### What are Magnetars?

A magnetar is a type of neutron star.

They are the most powerful magnets in the cosmos.

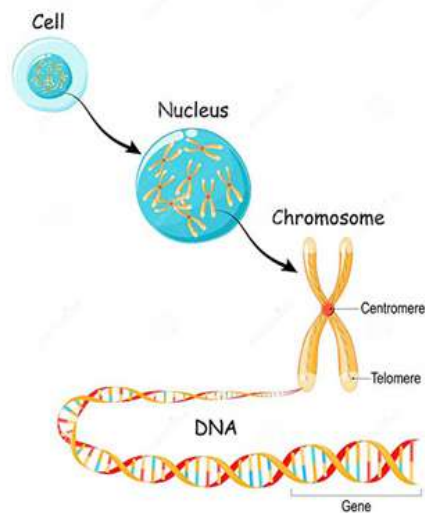
Their magnetic fields are 5,000 trillion times more powerful than that of the Earth.

## 'Y' CHROMOSOME

### Why in News?

Researchers have discovered that the Y chromosome possesses genes linked to ageing and lifespan regulation.

The Y chromosome, known as the “master of maleness,” determines the biological male sex and carries genes that play a role in sex determination.



### Findings

Recent research has revealed that the Y chromosome possesses genes vital to biological functions, including those related to ageing and lifespan regulation.

The study of species that have naturally lost their Y chromosome, such as rodents, provides insights into sex-chromosome turnover and the repurposing of other chromosomes as sex chromosomes.

### About Chromosomes

Chromosomes are thread-like structures found in the nucleus of cells that carry genetic information. They come in pairs, with each pair containing one chromosome from father and mother each. Humans typically have 23 pairs of chromosomes in most cells (except for reproductive cells which have 23 chromosomes). Chromosomes play a crucial role in cell division and inheritance.

### How is the Y chromosome characterised?

Estimated to have emerged around 200-300 million years ago in a common ancestor of all mammals, the Y chromosome has had a unique genetic journey, and embedded within its DNA lies a remarkable tale of evolution.

Scientists published the complete genetic sequence of the Y chromosome in 2003. This sequence provided an outline of 23 million bases of the 60 million Of Y chromosome. In total, the chromosome encoded for only 55 genes and accounted for around 2% of the genetic material inside a cell.

Many researchers jokingly refer to the Y chromosome as the “juvenile delinquent” among chromosomes thanks to its abundance of repetitive sequences, poor functional utility (with a small number of genes), reluctance to socialise (i.e. recombine with other chromosomes), and a high proclivity to degenerate over the course of evolution.





# SECURITY

What's Inside?

1. ARUNPOL APP
2. VARUNASTRA
3. NEW TREATY FOR OUTER SPACE
4. UN HIGH SEAS TREATY
5. INS KIRPAN
6. INDIA – US DRONE DEAL

## ANJADIP AND SANSHODAK

### Why in news?

Two warships named Anjadip and Sanshodhak launched at Kattupalli in Chennai.

### Anjadip

It is the 3rd of the 8 ships of the contract that was signed between **Garden Reach Shipbuilders and Engineers and Ministry of Defence** in 2019.

The ship was named after the **island of Anjadip located off Karwar Port**, Karnataka signifying its strategic maritime importance. The island is located in the Arabian sea.

The 'Arnala' class of ships would replace the current 'Abhay' class of Anti-Submarine Warfare Corvettes of the Navy.

*Operations* - Anti-submarine operations in coastal waters, low intensity maritime operations, subsurface surveillance among others.

### Anti-Submarine Warfare Shallow Water Craft (ASW-SWC) Project

It is signed to build 8 ASW SWC ships.

It is signed between Ministry of Defence and Garden Reach Shipbuilders & Engineers (GRSE), Kolkata, 2019.

They are designed to undertake ASW duties – including **subsurface surveillance** in littoral waters, **search-and-attack unit (SAU) missions** and **coordinated anti-submarine warfare operations** with naval aircraft.

They were also designed to provide secondary duties – including defense against intruding aircraft, minelaying and search-and-rescue (SAR)

### Sanshodhak

The ship named 'Sanshodhak', meaning 'Researcher' is the 4th ship of Survey Vessels Large (SVL) Project.

It is being built by L&T/ GRSE for Indian Navy.

It is **indigenously developed** under the Atmanirbar Bharat programme.

SVL ships will replace the existing Sandhayak Class survey ships, with new generation hydrographic equipment, to collect oceanographic data.

### Functions –

Coastal and deep-water hydrographic surveys of Ports and navigational channels.

Collect oceanographic and geophysical data for defence.

HADR, and can serve as Hospital ship during emergencies.



### Survey Vessels (Large) (SVL) Project

It is signed to build 4 SVL ships.

It is signed between Ministry of Defence and Garden Reach Shipbuilders & Engineers (GRSE), 2018.

## ARUNPOL APP

### Introduction of Arunpol App:

Arunachal Pradesh Police has launched the 'Arunpol App' and 'e-Vigilance portal' to enhance the safety and security of the state's citizens.

### Arunpol App Features:

The app allows people to file complaints without visiting a police station. It offers online services such as reporting lost items, obtaining police clearance certificates, filing missing reports, women and children's tenant verification, and access to vital helpline numbers. Initially, it provides 16 services.

### Benefits of Arunpol App:

The app aims to raise awareness about police efforts to maintain law and order while gathering feedback from the public.

It promotes transparency, people-friendly

policing, and contributes to maintaining law and order in the state.

### Additional Launches:

Alongside the app, the 'ArunPolSewa Vehicle' has been introduced.

This vehicle will be used for community awareness programs on crime prevention, fire safety, and anti-drug campaigns.

Equipped with smart TV panels and audio systems, it will be operated by trained police personnel, increasing public confidence in the state police force.

### Static Information:

The Chief Minister of Arunachal Pradesh is Pema Khandu. Arunachal Pradesh is the largest state among the Seven Sister States of Northeast India in terms of area

## VARUNA STRA

### Why in the News?

The Navy test-fired an indigenously designed and developed heavyweight torpedo, Varunastra, with a live warhead against an undersea target.

### About

It is an indigenously designed and developed heavyweight, ship-launched anti-submarine torpedo.

It was designed and developed by the **Naval Science and Technological Laboratory** in Visakhapatnam under the Defence Research and Development Organisation.

It will replace the older torpedoes on all naval ships which can fire a heavyweight torpedo.

It is named after a legendary weapon created by the Hindu god of the oceans, Varuna.

The-ship launched variant of the Varunastra

torpedo was formally inducted into the Indian navy by defence minister Manohar Parrikar and designed by security adviser Satyam Kumar on 26 June 2016.

### Special features of Varunastra:

The Varunastra torpedo is powered by an electric propulsion system with multiple 250 KW's silver oxide zinc (AgOZn) batteries.

It can achieve speeds in excess of 74 km/h, weighs around 1.5 tonnes and can carry 250 kg of conventional warhead.

This torpedo has more than 95 per cent indigenous content.

It is the only torpedo in the world to have a GPS-based locating aid.

It is an electrically-propelled anti-submarine torpedo capable of targeting quiet submarines,



both in deep and shallow waters.

### About Torpedoes:

A torpedo is a self-propelled **underwater projectile** designed to be launched from submarines, surface vessels, or aircraft. It is

primarily used as a weapon to attack and destroy enemy ships or submarines. Torpedoes are typically cylindrical in shape and contain an explosive warhead, propulsion system, guidance system, and control surfaces.

#### Submarine programmes in India

- The 30-year plan (2000-30) for indigenous submarine construction, launched in 1999, envisaged two production lines of six submarines each to be built in India in partnership with a foreign Original Equipment Manufacturer (OEM).
- These projects were called P-75 and P-75I.
- A contract for P-75 was signed only by 2005, with France's DCNS.
- P-75 has delivered three Kalvari Class Scorpene submarines so far but the P-75I project has not taken off.



## NEW TREATY FOR OUTER SPACE

### Why in the News ?

The UN recommends new treaty to ensure peace & security in outer space.

### About

The United Nations (UN) has recently

released a policy brief titled “For All Humanity — The Future of Outer Space Governance,” recommending the development of a new treaty to ensure peace, security, and the prevention of an arms race in outer space.

The recommendations come ahead of the

upcoming UN Summit of the Future, scheduled for September 2024, in New York. The summit aims to facilitate multilateral solutions and strengthen global governance to address future challenges.

## What is Outer Space ?

Outer space, also known as space or celestial space, refers to the vast expanse beyond Earth's atmosphere and between celestial bodies.

It is a vacuum that exists beyond the Earth's atmosphere and extends indefinitely throughout the universe.

Outer space is characterized by extremely

2,470 in 2022.

Countries like the United States, China, India, and Japan are leading the way in space activities, including manned missions, lunar exploration, and resource exploitation.

National Aeronautics and Space Administration (NASA) , through its Artemis mission, plans to land the first woman and the next man on the Moon.

Minerals on the Moon (has rich deposits of helium 3, which is rare on Earth), asteroids (abundant deposits of valuable metals, including

### Existing UN Treaties

- The treaties commonly referred to as the “five United Nations treaties on outer space” are:
  - The Outer Space Treaty 1967: Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.
  - Rescue Agreement 1968: Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space.
  - Liability Convention 1972: Convention on International Liability for Damage Caused by Space Objects.
  - The Registration Convention 1976: Convention on Registration of Objects Launched into Outer Space.
  - The Moon Agreement 1979: Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.
- India is a signatory to all five of these treaties but has ratified only four. India did not ratify the Moon agreement.

low density and pressure, as well as the absence of air and other atmospheric elements.

## What are the Key Highlights?

### Increasing Satellite Launches:

There has been an exponential increase in satellite launches over the past decade, driven by both government and private sector participation.

In 2013, there were 210 new launches, which increased to 600 in 2019 and 1,200 in 2020 and

platinum, nickel and cobalt) and planets can be attractive for countries.

### Lack of International Framework:

There is an absence of an agreed international framework on space resource exploration, exploitation, and utilization.

The brief underscores the importance of establishing mechanisms to support the implementation of space resource activities while addressing issues of jurisdiction, control, liability,

and responsibility for environmental pollution.

### Coordination and Space Traffic Management:

The current coordination of space traffic is fragmented, with different national and regional entities employing varying standards and practices.

The lack of coordination poses challenges for countries with limited space capacity.

### Space Debris and Environmental Concerns:

The proliferation of space debris is identified as a significant issue, with thousands of objects posing threats to operational spacecraft.

The UN calls for legal considerations related to jurisdiction, control, liability, and responsibility for environmental pollution caused by space debris. Technology to remove space junk is being developed, but the legal aspects require attention.

### What are the Recommendations?

New Treaty for Peace and Security

The UN recommends the negotiation and development of a new treaty to ensure peace, security, and the prevention of an arms race in outer space.

This treaty would establish international norms, rules, and principles to address emerging threats and promote responsible space activities.

#### Coordinated Space Situational Awareness

Member states are urged to establish an effective framework for coordinating space situational awareness, space object maneuvers, and space events. This coordination will enhance the safety and security of space operations.

#### Space Debris Removal Framework

The UN calls for the development of norms and principles for Space Debris removal, considering both legal and scientific aspects.

An effective framework for sustainable exploration, exploitation, and utilization of space resources, particularly on the Moon and other celestial bodies, is recommended.

## UN HIGH SEAS TREATY

### Why in the News?

Un adopts first ever agreement to protect its high seas.

### About

The United Nations has adopted the **first-ever international treaty** to govern the high seas and protect remote ecosystems vital to humanity. The pact that will establish a **legal framework** to extend environmental protections to international waters, known as the high seas.

It will be opened for signatures on September 20, during the annual meeting of world leaders at the UN General Assembly. The treaty will take effect once it is ratified by 60 countries.

### What are high seas?

The high seas are the parts of the ocean that are not included in the exclusive economic zones, territorial sea or internal waters of a State. **Water beyond 200 nautical miles** from the coast of a

country is known as high sea. High seas are the areas of the ocean for which no one nation has sole responsibility for management.

### Need for the UN high seas treaty

#### Ocean and biodiversity

The high seas comprise 64 percent of the ocean surface, and about 43 per cent of the Earth. These areas are home to about 2.2 million marine species and up to a trillion different kinds of microorganisms. Only about 1.44 per cent of high seas are currently protected, according to the International Union for Conservation of Nature (IUCN).

#### Ocean and global climate

Oceans are an integral part of the global climate cycle, and **perform a range of ecological services** including absorption of carbon dioxide and excess heat. Hence, this treaty is being considered as a landmark in the efforts to keep

the planet habitable.

### Unregulated human activities

Climate change is already influencing, and is being influenced by, ocean systems, and is exacerbating the pressures on marine biodiversity from unregulated human activities. It is these specific challenges — a combination of climate change, biodiversity, and pollution — that the High Seas Treaty seeks to address.

### UNCLOS and concerns regarding the biodiversity

Though UNCLOS asks countries to protect the ocean ecology and conserve its resources, it does not provide the specific mechanisms or processes to do so. Hence, it is believed that the High Seas Treaty will work as an implementation agreement under the UNCLOS.

This is similar to the Paris Agreement working under the UN Framework Convention on Climate Change (UNFCCC).

## UN high seas treaty

Agreed under the UNCLOS, this treaty is commonly known as the agreement on **biodiversity beyond national jurisdictions (BBNJ)**. This treaty is the first international law to offer some protection to the nearly two-thirds of the ocean that is beyond national control. This treaty will be legally binding in nature.

### Key provisions of the UN high seas treaty

Demarcation of marine protected areas (MPAs)

MPAs are where ocean systems, including biodiversity, are under stress, either due to human activities or climate change. These can be called the national parks or wildlife reserves of the oceans.

Activities in these areas will be highly regulated, and conservation efforts similar to what happens in forest or wildlife zones, will be undertaken.

In December 2022, at the meeting of the Convention on Biodiversity (CBD) in Montreal, Canada, countries had agreed to put at least 30 per cent of degraded coastal and marine ecosystems

under effective restoration by 2030. MPAs will be helpful in achieving this objective.

Sustainable use of marine genetic resources and equitable sharing of benefits arising from them

Genetic information from marine organisms is already being extracted, and their benefits are being investigated.

The treaty seeks to ensure that any benefits arising out of such efforts, including monetary gains, are free from strong intellectual property rights controls, and are equitably shared amongst all.

The knowledge generated from such expeditions are also supposed to remain openly accessible to all.

Initiation of the practice of **environmental impact assessments** for all major activities in the oceans. The results of this exercise have to be shared with the international community.

Capacity building and technology transfer - This will help small island states and landlocked nations, who do not have the resources or the expertise, to meaningfully participate in the conservation efforts.

Creation of New body - The treaty will create a new body to manage conservation of ocean life and establish marine protected areas in the high seas.

## Challenges for the UN high seas treaty

Many issues remain unaddressed, including the mechanisms for policing the protected areas, the fate of the projects that are assessed to be heavily polluting, and the resolution of disputes.

The process of ratification is not expected to be easy. It took UNCLOS 12 years to become international law because the necessary number of ratifications was not reached.

Provisions of this treaty do not overrule regulations laid down by the authorities that oversee existing high seas activities. Authorities overseeing high seas activities include:

the International Maritime Organization,

which is responsible for shipping;

the International Seabed Authority, which oversees deep-sea mining;

17 regional fisheries management organizations tasked with regulating fisheries in various parts of the ocean, including Antarctica.

Military activities and existing fishing and

commercial shipping are, in fact, exempt from the treaty.

Hence, the treaty cannot create protected areas in places already covered by fishing agreements, even if that fishing is unsustainable and depleting stocks.

## INS KIRPAN

### Why in the News?

India gifts the missile corvette INS Kirpan to Vietnam.

### About

India gifted the indigenously-built in-service missile corvette INS Kirpan to Vietnam to enhance that country's naval capabilities. Defence Minister Rajnath Singh announced this after bilateral talks with his visiting Vietnamese counterpart General Phan Van Gang.

Both Ministers identified means to enhance existing areas of collaboration, especially in defence industry cooperation, maritime security and multinational cooperation.

### Developments in India- Vietnam Relations

In 2007, Relations between the two countries were elevated to the level of 'strategic partnership' during the visit of Vietnam's then Prime Minister Nguyen Tan Dung to India.

In 2016, during Prime Minister Narendra Modi's visit to Vietnam, bilateral relations were further elevated to a "comprehensive strategic partnership" .

With India stressing on its Act East policy, Vietnam has emerged as a key partner, and defense engagements between the two nations include wide-ranging contacts between the services, military-to-military exchanges, capacity building, and training programmes.

Hanoi has procured 12 high speed patrol boats for the Vietnamese border guard force under a \$100 million Line of Credit (LoC) extended in

September 2014.

Vietnam is interested in India's Akash surface-to-air systems and Dhruv advanced light helicopters and Brahmos missiles.

In 2016, India extended another \$500 million defence LoC

June 2022, India and Vietnam signed a Memorandum of Understanding (MoU) on mutual logistics support and the two Defence Ministers signed the "Joint Vision Statement on India-Vietnam defense partnership towards 2030"

### Significance of Vietnam

Vietnam is an important partner in India's 'Act East' policy and the Indo-Pacific vision.

The China Factor - weighs heavily in the respective strategic calculus of India and Vietnam.

Both countries had fought wars with China and both have border problems with that country. China aggressively continues to encroach in the territories of the two countries. ( China's Nine dash line limits Vietnam's Exclusive Economic Zone as per UNCLOS)

Hence, it is natural for both the countries to come closer with a view to restrain China from its aggressive actions.

To counter China's 'string-of-pearls' strategy to surround and contain India in a "South-Asia"

Convergence of interest: Blue economy, building supply chain resilience, economic integration of the region etc.

### Way Forward

The strategic partnership under the broad



India-Vietnam cooperation framework would be critical towards building the vision laid out under India's 'Act East' Policy, which looks to expand engagement that is mutually positive and which ensures inclusive growth for all in the region.

eventually lead a step towards the realisation of SAGAR (Security and Growth all in the region) initiative as hailed by the Indian PM.

India and Vietnam both can mutually benefit each other in the arena of Blue Economy and



Strengthening ties with Vietnam will

ocean security.

## INDIA – US DRONE DEAL

### Why in News?

U.S President Joe Biden and Prime Minister Narendra Modi welcomed India's plans to procure General Atomics MQ-9B High Altitude Long Endurance (HALE) Unmanned Aerial vehicles (UAV)

### What is the Deal?

India and the United States agreed to a USD3 billion deal for 31 **High Altitude Long Endurance (HALE) UAVs**.

The Army and the Indian Air Force will each receive eight of the **land-based SkyGuardian drones**, while the Navy will receive 15 **SeaGuardian drones** as part of this agreement.

The MQ-9Bs will be assembled in India as part of this proposal, and General Atomics will also set up a comprehensive global maintenance, repair, and overhaul (MRO) facility.

### Significance for India

Boost to Indigenous Defense Capabilities

India is attempting to increase the deal's indigenous content. India hopes to enhance the proposed indigenous content from the present 8–9% to 15–20%.

In addition to setting up a complete Maintenance, Repair, and Overhaul (MRO) center for these drones, the US has committed to construct Predator drones in India.



**MQ-9B**  
Predator Drones

Max Gross Takeoff Weight: 5,670 kg  
Fuel Capacity: 2,721 kg  
Payload Capacity: 2,177 kg across 9 hardpoints (8 wing, 1 centerline)

**Crew:**  
Two pilots in ground control stations

**Weapons**  
Laser guided missiles  
Anti-tank missiles  
Anti-ship missiles

**Missions**

- Humanitarian Assistance/Disaster Relief
- Search and Rescue
- Law Enforcement
- Border Enforcement
- Defensive Counter Air
- Airborne Early Warning
- Electronic Warfare
- Anti-Surface Warfare
- Anti-Submarine Warfare
- Airborne Mine Counter Measures
- Long-Range Strategic ISR
- Over-the-Horizon Targeting

If the indigenous content increases, this might even broaden to possibly include the production of some electronics, sensors, and avionics.

Enhance cutting edge capabilities

The India-US agreement will improve India's military forces' intelligence, surveillance, and reconnaissance (ISR) capabilities across domains.

India would construct the cutting-edge drones, greatly enhancing India's long-term objectives to increase defense capabilities.

### Global Implication

The MQ-9 system is used in the UK, France, Italy, Japan, Australia, and Spain, among other nations.

The General Atomics MQ-9B High-Altitude Long Endurance (HALE) UAVs are important for India in light of the technologically advanced nations.

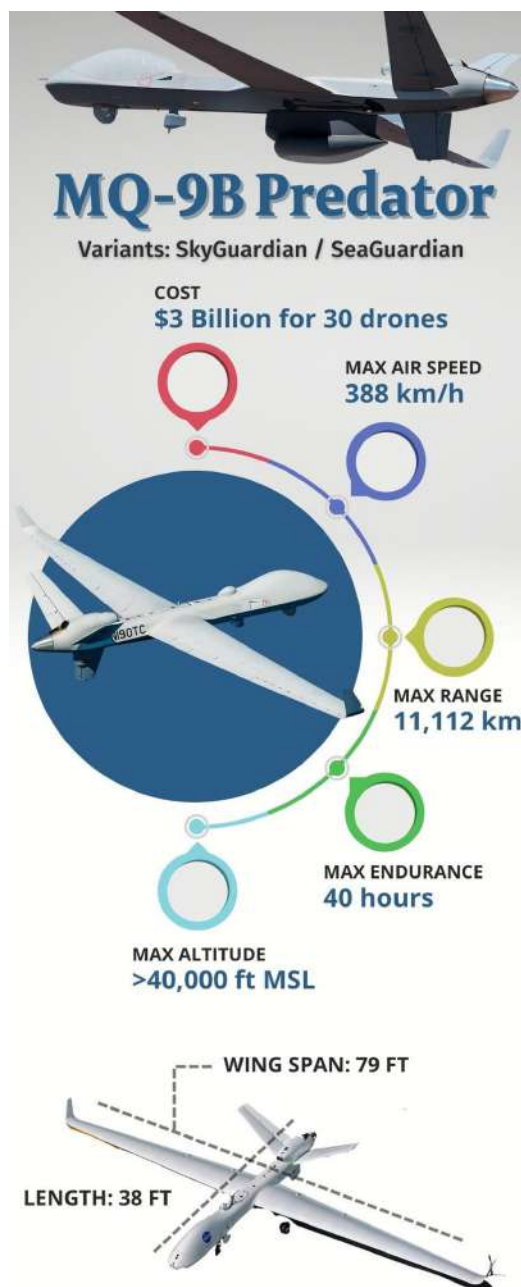
The Sea Guardian UAS, which is produced by the American company General Atomics, was first made available to India as a non-treaty partner.

Advancement to Indian expertise

Since other nations also use the Predators platform, we can anticipate that some Predators from those nations will eventually travel to India for maintenance, repair, and overhaul.

Foster Aero Engine Development

India has historically struggled to produce aero engines, so this agreement will be a huge step in the right direction for the nation's effort to produce its own jet engines.



**MQ-9B Predator**  
Variants: SkyGuardian / SeaGuardian

**COST**  
\$3 Billion for 30 drones

**MAX AIR SPEED**  
388 km/h

**MAX RANGE**  
11,112 km

**MAX ENDURANCE**  
40 hours

**MAX ALTITUDE**  
>40,000 ft MSL

**WING SPAN: 79 FT**

**LENGTH: 38 FT**



# HISTORY



# ART & CULTURE



## What's Inside?

1. INDIA'S LARGEST NATURAL ARCH DISCOVERED IN ODISHA BY GSI
2. NATIONAL MARITIME HERITAGE COMPLEX IN LOTHAL, GUJARAT
3. HOMO NALEDI
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## INDIA'S LARGEST NATURAL ARCH DISCOVERED IN ODISHA BY GSI

The Geological Survey of India (GSI) has unearthed the Sundargarh Natural Arch in Odisha, believed to be approximately 184 million years old from the Jurassic period.

The arch, with a length of 30 meters at the base and a height of 12 meters, may become the largest natural arch in India to receive the Geo Heritage tag.

The area surrounding the arch contains significant primary sedimentary structures, indicating a high-energy fluvial environment during its formation.

The arch owes its existence to fault activities

and unique lithotypes that facilitated sub-aerial weathering over time.

GSI's efforts include designating and protecting Geo Heritage Sites, collaborating with state governments to preserve these remarkable geological locations.

Geo Heritage Sites possess exceptional geological features and are crucial for conservation and study.

GSI, founded in 1851, is a scientific agency under the Ministry of Mines, headquartered in Kolkata, West Bengal.

## NATIONAL MARITIME HERITAGE COMPLEX IN LOTHAL, GUJARAT

Ministry of Ports, Shipping, and Waterways to develop National Maritime Heritage Complex in Lothal, Gujarat under Sagarmala program.

Estimated cost of the project is ₹4,500 crore.

Complex aims to showcase India's maritime heritage from ancient to modern times.

"Edutainment approach" using cutting-edge technology to create an international tourist destination.

Onsite project progress review meeting scheduled for July 2, 2023.

Key features include world's highest lighthouse museum, world's largest open aquatic gallery, and India's grandest naval museum.

Complex to boost tourism and economic development in the region.

Unique features include Lothal mini recreation, four theme parks, and fourteen galleries showcasing India's maritime heritage.

Coastal States Pavilion to highlight maritime contributions of India's states and union territories.

## HOMO NALEDI

### Why in news?

Recently, a study has been published, which suggests that Homo Naledi, an ancient human species, may have buried their dead and created meaningful symbols in a cave. However, these claims have sparked controversy within the scientific community.

### About

Homo naledi is an extinct species of archaic human discovered in 2013 in the Rising Star Cave, Cradle of Humankind, South Africa dating to the Middle Pleistocene 335,000–236,000 years ago.

H. naledi anatomy indicates that, though they were capable of long-distance travel with a humanlike stride and gait, they were more arboreal than other Homo, better adapted to climbing and suspensory behaviour in trees than endurance

running.

Tooth anatomy suggests consumption of gritty foods covered in particulates such as dust or dirt.

Though they have not been associated with stone tools or any indication of material culture, they appear to have been dextrous enough to produce and handle tools, and likely manufactured Early or Middle Stone Age industries.

**Mosaic Evolution** – It is the occurrence, within a given population of organisms, of different rates of evolutionary change in various body structures and functions

The existence of mosaic evolution in Homo naledi can be seen in its combination of primitive and derived traits. Primitive traits are characteristics that resemble those of more ancient ancestors, while derived traits are more advanced features that are typically associated with later species. In the case of Homo naledi, it exhibits a mix of both primitive and derived traits, creating a mosaic pattern.

## Findings of the recent study on Homo naledi

1. **Intentional Burials** - Homo Naledi deliberately buried their dead, which would challenge existing notions about advanced mortuary behavior.

Humans exhibit a unique behavior among primates by burying their dead, which sets them apart from other animals. This behavior is known as Mortuary behavior, characterized by social acts and a complex understanding of death.

Homo are the only primates which exhibits the behaviour of intentional behaviour.

Previously, the earliest evidence of Mortuary

behavior was found among Neanderthals and modern humans, occurring more than 100,000 years after Homo naledi.

2. **Abstract shapes and patterns** (meaningful symbols) etched into the cave walls near the presumed burials. The inscribed surfaces appear to have been prepared with a substance and smoothed, and some of the markings seem to have been **erased and engraved over**, indicating that they were made over a period of time.

3. As the Homo naledi with a brain size of 600 cu.cm was also capable of complex cognitive functions such as burials, making meaningful symbols similar to later species like Homo sapiens, The **brain size shouldn't be a major factor** in determining whether a hominin species is capable of **complex cognition**. But the brain structure and wiring play a major role in complex cognition. In addition, another small-brained species, **Homo floresiensis**, is known to have used tools and fire



4. **Use of Fire:** Homo naledi used fire strategically for illumination during mortuary and engraving activities in the cave.

## AHMEDNAGAR TO BE RENAMED 'AHILYANAGAR'

### Why in news?

Maharashtra Chief Minister Eknath Shinde announced that Ahmednagar city would be renamed 'Ahilyanagar' after the 18th century Maratha queen Ahilyabai Holkar, famed for her piety and benign administration.

### About

The renaming of Ahmednagar follows the Shinde-Fadnavis government's move in February this year to rename Aurangabad as 'Chhatrapati Sambhajnagar' and Osmanabad as 'Dharashiv.'

The demand for renaming Ahmednagar was started by BJP leader and MLC Gopichand Padalkar, an influential leader of the Dhargar community.

The community has a special reverence for Ahilyabai given that the queen and her father-in-law, Malharrao Holkar – the progenitor of the Holkar dynasty – were from the Dhargar (shepherd) community.

**Aurangabad** was built by **Aurangzeb** in the 1650s to commemorate his **first Viceroyalty of the Deccan**. Later, during the Maratha wars, Aurangzeb eventually captured and cruelly killed Sambhaji (in 1689 CE), the son of Maratha warrior king Chhatrapati Shivaji. **Osmanabad** was named after **Mir Osman Ali Khan**, the last ruler of Hyderabad.

## Ahmed Nagar

Located in the Western region of Maharashtra, Ahmednagar has been a part of some prominent kingdoms, starting from 240 BC, “when the vicinity is mentioned in the reference to the Mauryan Emperor Ashok.

In the Medieval period, the region was ruled over by the **Rashtrakuta Dynasty, the Western Chalukyas, and then the Delhi Sultanate**.

In the last case, the rule was not direct, and a **revolt by Afghan soldier Alladin Hasan Gangu** led to the establishment of the **Bahmani kingdom in the Deccan**. In the following years, **Ahmednagar**, then known as **Nizamshahi**, became one of the five independent kingdoms to emerge from that empire.

In 1486, **Malik Ahmad Nizam Shah** assumed the position of the Bahmani Sultanate’s prime minister.

He successfully defeated the king of the Bahmani kingdom, who tried to dislodge him from power, in 1490. Four years later, he laid the foundation of a city close to where he had defeated the army, on the **left bank of Sina river**. This city was named after him: Ahmednagar.

## Ahilyabai Holkar

Ahilyabai was born in **Chondi village of Ahmednagar** to the village head Mankoji Shinde, who ensured that his daughter received an education, which was quite rare at that time.

It is believed that **Malhar Rao Holkar**, the army commander to **Peshwa Bajirao**, spotted eight-year-old Ahilyabai at a temple service in Chondi. Impressed by her devotion and character, he decided to get his son, **Khande Rao, married to her**.

After her husband’s death in the **Battle of Kumbher** against the king of Bharatpur in 1754, Ahilyabai took **control of Malwa**. She excelled at administrative and military strategies under the guidance of her father-in-law, who believed she should lead her people, and not die by Sati after Khande Rao passed away.

After the death of her father-in-law and son a few years later, she petitioned the Peshwa to become the ruler, backed by the support of her army.

## TAM PÀ LING CAVE OF LAOS

### Why in news?

Recently, a team of researchers have been excavating at Tam Pà Ling caves for many years and found more and more evidence of Homo sapiens of earlier times.

### About

### Key findings:

It revealed that humans were present in the vicinity of Tam Pà Ling Cave for roughly **56,000**

years.

It also confirmed that, far from reflecting a rapid dump of sediments, the site contains sediments that accumulated steadily over some 86,000 years.

The age of the lowest fossil, a fragment of a leg bone found seven metres deep, suggests modern humans arrived in this region between 86,000 and 68,000 years ago.

Even researchers found a **toothsome 150,000**

### years old belonging to a Denisovan.

This suggests the site may lie on a previously used dispersal route among hominins.

### Key Facts about Tam Pà Ling Cave

It is a sloping cave situated high in the Annamite mountain range in Northern Laos.

The stratigraphy of the site indicates formation by periodic slope wash deposition from the muddy slope at the entrance of the cave.

Tam Pa Ling Cave is situated at the top of Pa Hang Mountain.

The cave has a single, south-facing opening and descends 65 m to its main gallery. The main gallery measures 30 m from north to south and 40 m from east to west.

Tam Pa Ling Cave is part of a network of karst caves, formed by the dissolution of limestone beds.

The limestone in the area was deposited during the Upper Carboniferous and Permian periods.

The limestone in the region is rich in fossils, including dinosaur bones and teeth.

### Luminescence Dating and Mineral Signals

Luminescence dating techniques were employed, relying on light-sensitive signals that accumulate in buried sediment and reset to zero when exposed to light.

Quartz and feldspar minerals were mainly used for dating.

Quartz was used for dating the top three meters of sediment, while feldspar filled in the gap in the age profile for lower levels.

Fine-grain dating was utilized below six meters, using mixed tiny mineral grains.

### Dating Teeth and Supporting Evidence

Despite limited animal evidence, two teeth from a cow-like animal were found and dated using uranium series dating and electron spin resonance dating.

Combining the results of these techniques provided robust direct dates, which complemented the luminescence chronology.

Detailed analysis of sediments, including micromorphology examination, supported the dating evidence and assessed the origin of the fossils.

### Who are Denisovans?

They are extinct human relatives otherwise known only from remains found in Siberia and Tibet.

They lived lakhs of years ago, coexisting with Neanderthals in some regions and interbreeding with early modern humans in some cases.

They were first identified as a separate species in 2010, following the discovery of a fragment of a finger bone and two teeth, dating back to about 40,000 years ago, in the Denisovan Cave in Siberia.

## PURANA QILA EXCAVATION

### Why in the News?

Purana Qila excavations in Delhi reveal pre-Mauryan era settlement.

### About

New excavations have found **pottery** shards dating to around **1200 BC to 600 BC**, the remains of a 2,500 year-old ring well from the Mauryan era, and a four-room complex probably built 2,300 years ago.

Earlier excavations had been carried out in 2013-14 and 2017-18. Those efforts have revealed nine cultural levels, representing different historical periods, including **Pre-Mauryan, Mauryan, Sunga, Kushana, Gupta, Post Gupta, Rajput, Sultanate and Mughal**. The ongoing excavation, initiated in January 2023, aims to establish a complete chronology of the site.

### Recent Findings

The artefacts recovered — ranging from idols

of Hindu deities to over a hundred coins and almost three dozen seals among others — will be showcased as an Open Air Site Museum at the fort.

The new excavations have also found remains of a

### 900-year-old Vaikuntha Vishnu from the Rajput period

terracotta plaque of Goddess Gaja Lakshmi from the **Gupta** period

structural remains of a 2,500-year-old terracotta ring well from the **Mauryan** period,

well-defined four-room complex from the



**Sunga-Kushan** period dating back to 2,300 years ago

Also beads, seals, copper coins and a bone needle.

More than 136 coins and 35 seals and sealings

were discovered which indicates the site's pivotal role as a **centre for trade activities**.

Currently, structures from the early Kushana level have been exposed, with a depth of 5.50 metres reached thus far. This excavation is expected to provide **further insights into the ancient city of Indraprastha**.

The Purana Qila, built by Sher Shah Suri and Mughal emperor Humayun, is believed by many to be the site of **Indraprastha, as mentioned in the Mahabharata**.

### About Purana Qila

Purana Qila is one of the oldest forts belonging to the Mughal era and the site is identified as an ancient settlement of Indraprastha (the capital of Pandavas).

The massive gateway and walls of Purana Qila were built by Humayun in the 16th century and the foundation was laid for the new capital, Dinpanah.

The work was carried forward by Sher Shah Suri, who displaced Humayun.

The major attractions inside the fort are the Qila-i-Kuhna mosque of Sher Shah Suri, Sher Mandal (a tower, which is traditionally associated with the death of Humayun), a stepwell and the remains of the extensive rampart, which has three gates.

The unique features of Indo-Islamic architecture like horseshoe-shaped arches, bracketed openings, marble inlay, carving etc are very prominent in the structure.

The mosque has an inscription which says, 'As long as there are people on this earth, may this edifice be frequented, and people will be happy in it.'



## MESOLITHIC ROCK PAINTING

### Why in the News?

Recently, a Mesolithic period rock painting depicting a person tilling a piece of land has been found in Orvakallu village in Guntur district, Andhra Pradesh.

### About

Recently, a former archaeologist of Archaeological Survey of India (ASI) has discovered a Mesolithic period rock painting depicting a person tilling a piece of land in Guntur district, Andhra Pradesh.

It was found while surveying the **lower River Krishna Valley** to ascertain the architectural features of shrines.

### Key Findings

The paintings were made with “natural white kaolin and red ochre pigments”,

Ochre is a pigment composed of clay, sand, and ferric oxide.

Kaolinite is a soft, earthy, and usually white mineral produced by the chemical weathering of aluminum silicate minerals like feldspar.

These paintings throw light on aspects of the social life and culture of the people who lived in the area.

One of the paintings depicted a man catching a wild goat with his left hand while wielding a hook-like implement to control it.

Another showed two couples standing with their hands raised while a child stood behind them possibly indicating communal activities or rituals.

A significant painting showcases a man holding a plough and appearing to till the land. This depiction suggests a semi-settled life pattern where community members engaged in domesticating animals and cultivating crops, reflecting early agricultural practices.

### Mesolithic period

It is also called the Middle Stone Age which existed between the Paleolithic (Old Stone Age) and the Neolithic (New Stone Age).

**Timeframe:** This period is generally considered to have occurred between approximately 12,000-10,000 years ago

**Lifestyle:** During the Mesolithic period, human societies were predominantly hunter-gatherer communities.

People relied on hunting, fishing, and gathering wild plant resources for their sustenance.

Stone tools found during this period are generally tiny, and are called microliths.

Microliths were probably stuck onto handles of bone or wood to make tools such as saws and sickles.



At the same time, older varieties of tools continued to be in use.

## JATAN: A VIRTUAL MUSEUM SOFTWARE

An MoU has been signed between the MeitY and Union Culture Ministry to complete 3D digitisation of all museums (under central control) by the year-end for better conservation of artefacts.

The 3D digitisation would be done using the JATAN virtual museum builder software through 3D scanning.

3D scanning means analysing a real-world object or environment to collect 3-dimensional data on its shape and possibly its appearance.

The collected data is then used to construct digital 3D models.

### About JATAN

JATAN is a digital collection management

system for Indian museums designed and developed by Human Centres Design and Computing Group, Centre for Development of Smart Computing, Pune.

It can create 3D virtual galleries and provide public access through web, mobile or touchscreen kiosks.

### Museums included

1. Salar Jung Museum, Hyderabad,
2. Allahabad Museum in Prayagraj,
3. Indian Museum and the Victoria Memorial Hall, Kolkata,
4. National Museum and the National Gallery of Modern Art, New Delhi.

## VADNAGAR

### Why in the News?

New plans for PM Modi's school in his hometown **Vadnagar**.

### About Vadnagar

Vadnagar city in Gujarat is the hometown of Prime Minister Narendra Modi.

A school, which the PM attended, will be redeveloped by the Ministry of Culture.

Vadnagar city is an L-shaped town in the northern part of Gujarat spreading across 85 hectares.

During different periods of its history this city has been known by names like Anartapura, Anandapur, Chamatkarpur and has often been compared to Varanasi in terms of both claiming to be "living cities".

It was included in the Tentative list of the UNESCO World heritage sites in December 2022.

### Excavations and findings

Archaeological excavations in the city were undertaken first by archaeologists **B Subbarao and RN Mehta** from Maharaja Sayajirao University of

Baroda in 1953.

Recently, from 2014, the excavation work, in Vadnagar's Ghaskol, Darbargadh and Badi Garbano Sheri, taken over by the ASI has found over 20,000 artefacts.

Aim of such excavation of ASI is to establish its chronology and to help create an Experiential Museum.

This city is found to be a multi-layered and multi-cultural mercantile settlement.

### History of the city

**Abul Fazl's Ain-e-Akbari** terms this city as a large and ancient city inhabited by Brahmans and which contains 3,000 pagodas with tanks.

Seven successive cultures, **without a break**, going back to 750 BCE was found which are given below –

Pre-rampart phase (in 2nd century BCE).

Rampart phase (2nd century BCE – 1st century CE).

Kshatrapa phase (1st – 4th century CE).

Post-Kshatrapa phase (5th – 9th/10th century

CE).

Solanki phase (10th – 13th century CE).

Sultanate-Mughal phase (14th – 17th century CE) and

Gaekwad phase (17th/18th – 19th century CE).

**Trade**

Conch shell, with 11,000 shell bangles, cowry shells and other wares found here hinting a flourishing trade industry.

It implies, particularly cowry shells, its indirect involvement in overseas trade to the Maldives.

The city was one of the important hinterland land ports (Sthal Pattan) of Gujarat. It was Located at the intersection of two major trade routes –

Central India to Sindh and northwest and Gujarat to Rajasthan and north India.

A gold coin, believed to be of the Mamluk dynasty of Egypt (15th century), has also been found strengthening the belief in overseas trade.

**Buddhism and Jainism Influence**

Excavation works also finds fortification, a Buddhist monastery, votive stupas, house-complexes, lanes/streets which mainly belonged to pre-2nd century BCE to the Gaekwad period.

In 1992, a red sandstone image of a Bodhisattva or a deity-like revered figure in Buddhism was recovered from Vadnagar.

It was an important centre of Sammitiya Buddhists, a sect of Buddhism which was supported by Chinese traveller Hieun Tsang.

As per Hieun Tsang or Xuanzang, who visited Vadnagar around 641 CE and called it o-nan-to-pu-lo (Anandpur), in 10 monasteries there were 1000 monks of the Sammitiya School (Little Vehicle).

This city also shows Jain influence as according to a stone inscription of Arjuna Bari, the Jain King Kumarpal from the Solanki dynasty undertook repairs of the fort wall in 12th century CE.

**Architecture and monuments**

It was a historic fortified settlement, and religious centre/temple town.

Gates like the Ghanskol and Pithori are of the 11th- 12th century CE.

Other prominent gates are Nadiol Gate, Amtol Gate, Amarthol Gate and Arjun Bari Gate (protected by the ASI).

The Ambaji Mata Temple dates back to 10th-11th century CE, while other important Hindu and Jain temples within the town are from the 17th century onwards. For instance Hatkeshwar temple.

**Roman influence**

The ASI claims a “Roman connection” owing to the discovery of an intaglio in clay of Greco-Indian king Apollodotus II and a sealing of of a Roman coin belonging to Valentinian-I. A clay intaglio is a coin mould of Greco-Indian king Apollodotus II (80-65 BC)

**TREASURE TROVE FROM THE ANCIENT TOWN**

The interest in Vadnagar as an archaeological site got renewed in the past few years due to its position as a time capsule. According to experts, there are few sites in India that have cultural continuity of over 2,500 years

The finds so far include a mega structure near Sharmishtha Lake, cultural deposits from three locations in the town, the site of a cultural experiential museum near the lake and the nearby Taranga hills

A study of objects such as pottery, bones of animals found at the site and the change in cultural deposits give a glimpse into the distant past and how a place changed over the centuries

Apart from the structures, experts also found a huge cache of coins, cowrie shells, glass beads, ornaments made of semi-precious stones, ivory and shells, gold objects and terracotta objects

For example, the finds so far indicate Vadnagar was a prosperous town situated on a trade route with a robust shell industry. The finds also point at the presence of cattle used for farming and other animals for meat. The presence of foreign objects point to its trade across India and perhaps overseas during and after its Buddhist era

Indigenous pottery, for instance as torpedo jars and Glazed, establishes the city’s connections with the Sassanid region and West Asia

## THOL PAVAI KOOTHU

### Why in News?

A few artistes in Kanniyakumari district continue to perform puppetry, known as ‘Thol Pavai Koothu’, and keep the art alive. In recognition of his art, B. Muthuchandra Rao, winner of the Tamil Nadu government’s Kalaimamani Award, has been invited by the Federation of Tamil Sangams of North America (FeTNA) and Sacramento Tamil Mandrum to perform at the Fetna 36th Convention.

### Tholpavaikoothu

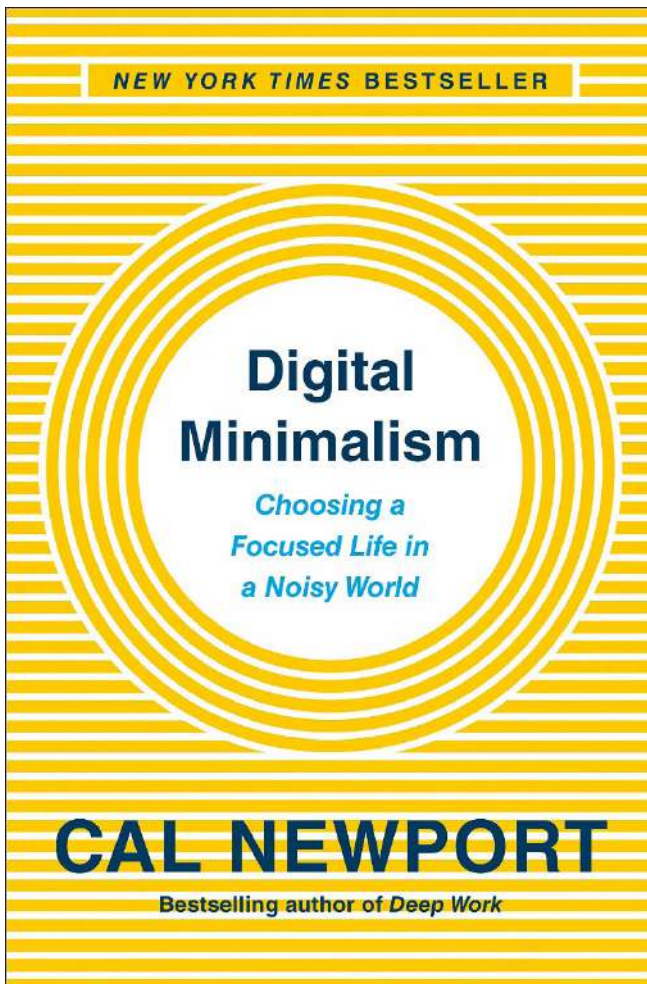
Tholpavaikoothu is a form of Shadow puppetry made of three Tamil terms, thol, meaning leather,

pavai, meaning doll, and koothu, meaning the play or drama. This form of art is especially popular in the Madurai, Kanyakumar (TN), Palakkad Thrissur and Malappuram districts of Kerala.

The story of Tholpavakoothu’s performance is from the Indian epic, Ramayana. The narrative used for the performance is a mixture of prose and poetry called Adalpattu. Accompanying instruments include Ezhupara, Chenda and Maddalam. The puppetry is staged on a special structure in temple premises called Koothumadam. It is also known as Nizhalkkoothu and Olakkoothu.



## “DIGITAL MINIMALISM” BY CAL NEWPORT



“People don’t succumb to screens because they’re lazy, but instead because billions of dollars have been invested to make this outcome inevitable.”

It’s Newport’s contention that checking “likes” is the new smoking.

**A Lopsided Arms Race:** Addiction is defined as “a condition in which a person engages in the use of a substance or in a behaviour for which the rewarding effects provide a compelling incentive to repeatedly pursue the behaviour despite detrimental consequences.”

After interviewing relevant people, author Adam Alter discovered that:

Our new technologies are particularly well suited to foster behavioural addictions;

In many cases, these addictive properties of new technologies are carefully engineered design features.

Tech companies encourage behavioural addiction through:

Intermittent positive reinforcement; and

The drive for social approval.

### Digital Minimalism: A Minimal Solution

Newport defines *Digital Minimalism* as, “A philosophy of technology use in which you focus your online time on a small number of carefully selected and optimized activities that strongly support things you value, and then happily miss out on everything else.”

“Minimalists don’t mind missing out on small things. What worries them much more is diminishing the large things they already know for sure make a good life good.”

**Digital Declutter:** A practice in which you define your technology rules, take a break, and reintroduce technology for good things.

Newport introduces a problem called Solitude Deprivation: A state in which you spend close to zero time alone with your own thoughts and free from input from other minds.

**Social Media Paradox:** Social media makes you feel both connected and lonely, happy and sad.

“The more you use social media to interact with your network, the less time you devote to offline communication, meaning you’re more likely to feel lonely and miserable.”

Newport borrows the following distinction from MIT professor Sherry Turkle. To succeed with digital minimalism, you have to confront this rebalancing between,

**Conversation** -> the much richer, higher bandwidth communication that defines real-world encounters between humans, and

**Connection** -> low-bandwidth interactions that define our online social lives, in a way that makes sense to you.

“A life well-lived requires activities that serve no other purpose than the satisfaction that the activity itself generates.”

“If you begin decluttering the low-value digital distractions from your life before you’ve convincingly filled in the void, they were helping you ignore, the experience will be unnecessarily unpleasant at best and a massive failure at worse.”

To follow what Newport calls, the **Bennett Principle**:

Prioritize demanding activity over passive consumption;

Use skills to produce valuable things in the physical world; and

Seek activities that require real-world, structured social interactions.

“**Attention economy**” describes the business sector that makes money-gathering consumers’ attention and then repackaging and selling it to advertisers. So, it’s time to think about “**Attention Resistance**.”

# FACT SHEET

## GENERAL STUDIES – II

### POLITY

#### News consumption

- ◆ The Reuters Institute Digital News Report, 2023 => Overall news consumption and sharing in India decreased from last year & sharp decline in access to online news by 12%, while television also experienced a 10%-point decline as a news source.
- ◆ India had a little decline in overall trust in the news of 3 percentage points. The countries with the highest rates of trust were Finland (69%) and Greece (19%).
- ◆ The news is increasingly relying on video-based information published on websites, particularly in portions of the Global South => shows, a move towards interactive and visual news formats.
- ◆ With 56% of respondents using YouTube to access news in India, it has emerged as the most popular social media channel for news -> Facebook (39%) and WhatsApp (47%).

#### Sex Workers

- ◆ According to the National AIDS Control Organisation (NACO) over 8000 female sex workers are employed in India, and more than 6000 of them have reported experiencing physical abuse or other types of maltreatment.
- ◆ Justice Verma Commission (2012–2013) agreed that there is a difference between adult, consenting women who engage in sex work of their own free will and women who are trafficked for commercial sexual exploitation.
- ◆ The Supreme Court ruled in the Budhadev Karmaskar v. State of West Bengal (2011) case that sex workers have a right to dignity.

### SOCIAL ISSUES

#### Gender Gap

- ◆ India has ranked 127 out of 146 countries in terms of gender parity -> an improvement over last year (135 out of 146 countries in the 2022 edition), according to the World Economic Forum's annual Gender Gap Report, 2023.

#### Health

- ◆ According to the Metabolic Non-communicable Disease health report of India: the ICMR-INDAB national cross-sectional study (ICMR-INDAB-17) => about 11% of the country's population is already diabetic (urban -> 16.4%; rural -> 9%).

- ◆ NFHS-5 (2019-21) => significant increase in the anaemia burden in India, with 57% of women (15 - 49 age group) and 67% of children (6 - 59 months) being anaemic.

## Children

- ◆ According to the National Family Health Survey, 40% of the world's 60 million child marriages take place in India.
- ◆ According to the International Centre for Research on Women, India has the 14th highest rate of child marriage in the world.

## Women

According to NFHS-5,

- ◆ Credit to women doubled in the last 5 years- 14% in 2022 from 7% in 2017.
- ◆ 69% loans to women under PM Mudra Yojana. Women borrowers increased at CAGR of 15% over the last 5 years. 79% of women-run enterprises are self-financed.
- ◆ Only 4.4% borrowed money from a financial institution or received assistance from the government.
- ◆ More than 70% of women in every state and UTs in the second phase have operational bank accounts.

# INTERNATIONAL RELATIONS

## India - United States

- ◆ Bilateral trade: USD 128 billion (2022-23). The US surpasses China as India's biggest trading partner.
- ◆ India is America's 9th largest trading partner.
- ◆ Exports from India to the United States increased by 2.8% to \$78 billion in the fiscal year 2022-23.
- ◆ Imports from the US surged by around 16% to \$50 billion. India had a trade surplus of \$28 billion (2022-23)
- ◆ US is the 2nd largest source of FDI for India & Indian FDI in US exceeds \$40 billion.
- ◆ Strategic Trade Authorization status to India -> exempts specific licences on Indian exports.
- ◆ India's defence acquisition from the US: \$13.6 billion (SIPRI)

# GENERAL STUDIES – III

## ECONOMY

- ◆ Remittance inflows could slow to just 0.2% in 2023, projected by the World Bank's latest Migration and Development Brief. It marks a dramatic slowing from 2022 when remittances to India grew by more than 24% to reach a record-high \$111 billion. The reasons: slower growth in OECD and GCC economies, high base effect.



- ◆ According to a report by the National Association of Software and Services Companies (NASSCOM), the Indian startup ecosystem is expected to create over 5,00,000 new jobs by 2025.
- ◆ According to the Global Innovation Index, India's rank in innovation has improved from 81st in 2015 to 40th in 2023.
- ◆ India is the 4th largest Asian medical devices market after Japan, China, and South Korea, and among the top 20 medical devices markets globally. India's current market share in the medical device category is 1.5% of the global space or \$11 billion in 2020. US dominates the global market with a 40% market share, followed by Europe and Japan at 25% and 15% respectively.
- ◆ Inland fish production increased from 28 lakh tonnes per year in 2000-01 to 121 lakh tonnes per year in 2021-22.
- ◆ Unemployment rate touched 8.1% [CMIE Data, 2023]
- ◆ Less than half of the Indian graduates are employable [India Skills Report]

### **Indian Pulse Sector**

- ◆ India is the largest producer (25% of global production), consumer (27% of world consumption) and importer (14%) of pulses in the world.
- ◆ Pulses account for around 20% of the area under food grains and contribute around 7 to 10% of the total foodgrain production in the country.
- ◆ Though pulses are grown in both Kharif and Rabi seasons, Rabi pulses contribute more than 60% of the total production.
- ◆ Gram is the most dominant pulse having a share of around 40% in the total production followed by Tur/Arhar at 15 to 20%.
- ◆ Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh and Karnataka -> top 5 pulses-producing States.
- ◆ UN declared 2016 as "International Year of Pulses" (IYP).

## **ENVIRONMENT**

- ◆ Today, India is the world's 3rd largest producer of renewable energy, with 40% of its installed electricity capacity coming from non-fossil fuel sources.
- ◆ According to UN data, more than 400 million tonnes of plastic is produced every year worldwide, half of which is designed to be used only once. Of that, less than 10% is recycled. Consequently, an estimated 19-23 million tonnes end up in lakes, rivers and seas annually.
- ◆ World's richest people emit unsustainable amounts of carbon and unlike ordinary people, 50% to 70% per cent of their emissions result from their investments (Oxfam report).
- ◆ The bottom 50% of households contribute 12% of the global total GHG emissions, whereas the top 1% emit contribute 17% of the total (Emission gap report 2022).

1. 'A greener way to die': Human composting is growing as an alternative to burial or cremation. It has emerged as a viable option in the US for bidding goodbye to loved ones. The soil produced through this procedure can be used for gardening or can be spread in designated memorial grounds or forest conservation areas.
2. Nigeria made history with the approval granted a new malaria vaccine- R21/Matrix-M, which has been developed by the University of Oxford and manufactured by the Serum Institute of India. It is the second vaccine ever developed for a disease.
3. Supreme Court has said, "The independence of the judiciary is part of the basic structure of the Constitution." Without impartial and independent judges in the judiciary, justice, which is a pre-ambular goal, would remain illusory. Judicial independence from the executive and the legislature requires the judiciary to also have a say in matters of finances.
4. The Government has acknowledged the contribution of seafarers during the pandemic and emphasized India's efforts to promote 'Ease of Doing Business' to reduce logistics costs and facilitate shipping to make India a pre-eminent player in the maritime sector. During the program, Sagar Samman Awards were awarded to the contributors to the growth of the Indian maritime industry.
5. To commemorate the 75th anniversary of diplomatic relations between India and Sri Lanka, the National Gallery of Modern Art in New Delhi has organized the "Geoffrey Bawa: It is Essential to Be There" exhibition. It showcased the architectural works of Sri Lanka's renowned architect, the late Geoffrey Bawa.
6. Recently, the Reserve Bank of India Governor launched a financial inclusion dashboard named 'Antardrishti'. It provides the necessary knowledge to evaluate and track the development of financial inclusion by recording relevant data. It will also make it possible to assess the degree of financial exclusion at a local level across the nation so that such places may be addressed.
7. The Nyaya Vikas Portal has been created for monitoring the implementation of the Centrally Sponsored Scheme, Nyaya Vikas. This portal helps in empowering stakeholders with seamless access to information about funding, documentation, project monitoring and approval.
8. The Union cabinet has approved a revival package of Rs 89,047 crore for state-run telecom operator BSNL. The measures include allotment of 4G/5G spectrum for the company through equity infusion. It is expected to help BSNL will emerge as a stable telecom service provider focused on providing connectivity to remotest parts of India.
9. Recently, the Madhya Pradesh government launched a six-day rally called the 'Rani Durgavati Gaurav Yatra' to commemorate the life and legacy of the 16th century queen, Rani Durgavati, who fought against the Mughals. Rani Durgavati, born in 1524 in Mahoba's Chandela dynasty which is known for building the famous Khajuraho temples.
10. Prime Minister Narendra Modi paid tributes to the fallen UN peacekeepers at the 'Wall of Peace' at the UN headquarters here and asserted that their selfless service will never be forgotten.

11. At least 68 people admitted to a district hospital in Uttar Pradesh are suspected to have died within 3 days due to scorching heatwave conditions. But it's when high temperatures are combined with high humidity that heatwaves become lethal.
12. The Cabinet Committee on Economic Affairs (CCEA) approved the PM-PRANAM scheme (Programme for Restoration, Awareness, Generation, Nourishment and Amelioration of Mother Earth). It aims to promote the use of nutrient-based biofertilizers for sustainable agriculture. It seeks to save soil fertility, reduce reliance on chemical fertilizers, and encourage balanced fertilizer usage.
13. People react, 'Not Mars, But New York City'. An orange haze engulfed the American city of New York due to the flames that have been raging north of the US-Canada border. Wildfires have been burning Canada's forests for several weeks, and the country has witnessed over 400 fire events so far.
14. Tamil Nadu state's proposal to construct the Kalaignar Pen Monument at Chennai's Marina Beach has received Coastal Regulation Zone (CRZ) clearance from the Union Ministry of Environment (MoEFCC).
15. Additional Collector of Erode district, Tamil Nadu has written to Chief Secretary, alleging caste discrimination by a senior official to whom he had reported shows caste discrimination even within the high-level bureaucracy.
16. The case properties that are seized or collected in due course of investigation in Central Crime Branch cases are preserved in the Malkhana, which is a safe depository. Now, the Central Crime Branch (CCB) of Greater Chennai Police has modernised its Malkhana system by enabling QR code reading.
17. A vacant plot of land belonging to the Southern Railway near the Villivakkam railway station was used to dump vegetable and plastic waste generated from a nearby market. A group of residents' welfare activists came together to tidy up the place and converted it into a garden. It is a classic example of active civil society participation in overall development.
18. Chennai police deployed an AI-based security network of 5,250 CCTV cameras at 1,750 locations. It was commissioned under the 'Chennai Safe City Project,' the AI-based software will use video analytics and will alert the Integrated Command and Control Centre for taking appropriate action even in case of SOS gestures made on the camera.
19. In Tamil Nadu, Adivasi craftsmen create life-sized elephants from lantana, an invasive plant species in India's forests. This initiative provides employment opportunities for the Adivasis, reduces the presence of lantana in the forest, and raises awareness about the coexistence of humans and wildlife.
20. The Union Cabinet has granted its approval for the National Research Foundation (NRF) Bill, 2023, aiming to establish the NRF as the apex body for scientific research in India. This move comes in alignment with the National Education Policy (NEP). With this, it is expected to provide strategic direction to scientific endeavours in the country.

## TERMS IN NEWS

01. Doctrine of Promissory Estoppel => It is a doctrine in contract law which seeks to enforce a promise made, whether oral or in writing. It seeks to protect the rights of a promisee or aggrieved party against the promisor. Example: A cloth vendor makes an oral promise to the customer to replace the shirt, if it doesn't fit the customer's size requirements. In this case, if the customer returns the shirt, the vendor is estopped from refusing it.
02. Fingerprinting of wood => also known as wood identification or wood forensics, is a technique used to determine the origin or species of wood samples. It has been increasingly employed as a tool to curb illegal deforestation and the illicit timber trade.
03. Execution-only platform (EOP) => It is a type of financial service provider that allows individuals to execute trades or transactions without receiving any advice or recommendations from the platform. It is often used by experienced investors who can potentially reduce costs by avoiding brokerage fees.

## RELEVANT QUOTES

1. Poverty: "Poverty often deprives a man of all spirit and virtue; it is hard for an empty bag to stand upright" - *Benjamin Franklin*.
2. Humanity: "You must not leave the faith in humanity. Humanity is an ocean, if few drops of the ocean are dirty, the ocean does not become dirty" - *Mahatma Gandhi*.
3. Child labour: "Child labour perpetuates poverty, unemployment, illiteracy, population growth and other social problems" - *Kailash Satyarthi*.
4. Globalization: "The negative side to globalization is that it wipes out entire economic systems and in doing so wipes out the accompanying culture" - *Peter L. Berger*.
5. Ethics: "Dharma is the foundation of good governance" - *Buddha*.