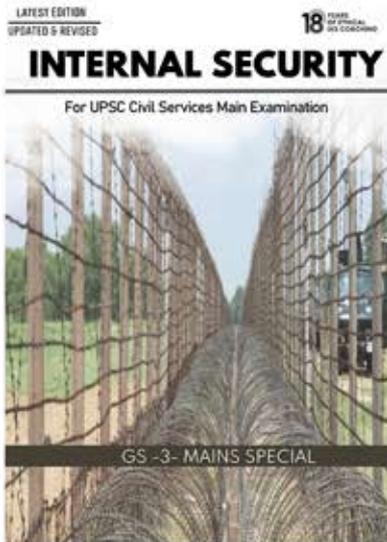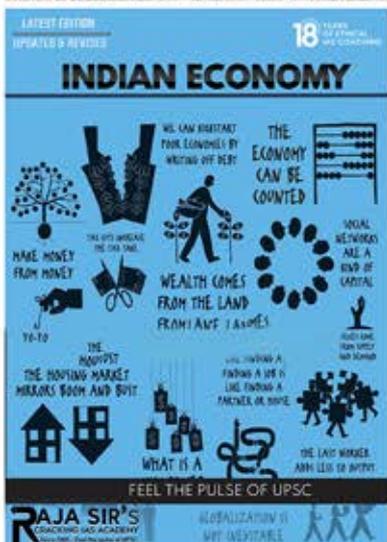# MONTHLY EDITORIALS

**SC backs TN position on Jallikattu**
A five-judge Constitution Bench of the Supreme Court has upheld the amendments made by Tamil Nadu, Maharashtra, and Karnataka to The Prevention of Cruelty to Animals (PCA) Act, 1960, allowing Jallikattu.....

**Article 239AA - SC on "Power Distribution Between Delhi Government and Centre**
Recently, the Supreme Court (SC) has ruled in favor of the Delhi government on the issue of who controls the Bureaucracy in the National Capital where it ruled that the Delhi government has legislative and
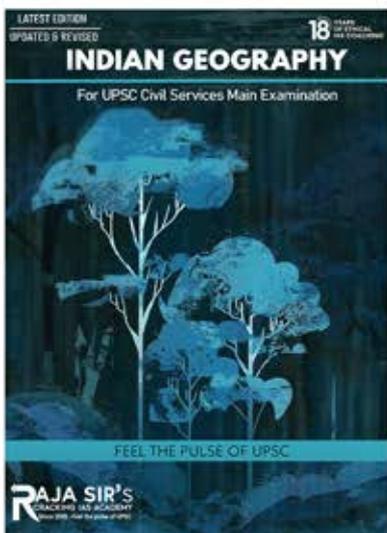
**Uniform Civil Code In India: Uniformity Or Conformity?**
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## Plastic-free planet: Recycling increases toxicity of plastics

A recent report by Greenpeace Philippines titled "**Forever Toxic: The science on health threats from plastic recycling**"was published at the Second Session of **Intergovernmental Negotiation Committee Meet in Paris,** suggesting that recycling may not be the solution to **Plastic Pollution** as it is often believed to be.

Plastic Pollution

- Unlike other forms of waste like paper, food peels, leaves etc., which are biodegradable (capable of being decomposed by bacteria or other living organisms) in nature,**plastic waste because of its non-biodegradable nature** persists **into the environment, for hundreds** (or even thousands) of years.
- **Major Polluting Plastic Waste:**
    - **Microplastics:**They are small plastic pieces of less than **five millimeters in size**.
        - **Microplastic includes microbeads**(solid plastic particles of less than one millimeter in their largest dimension) that are used in cosmetics and personal care products, industrial scrubbers, microfibers used in textiles and virgin resin pellets used in plastic manufacturing processes.
        - Due to sun **exposure and physical wear,**large pieces of plastic that were not recycled break up to produce microplastics.
    - **Single-use plastic:**It is a disposable material that can be used only once before it is either thrown away or recycled, like **plastic bags, water bottles, soda bottles, straws, plastic plates, cups,** most food packaging and coffee stirrers are sources of single use plastic.
- **Initiatives to Tackle Plastic Pollution:**
    - **Indian:**
        - **Plastic Waste Management (Amendment) Rules, 2022**
        - **Extended Producer Responsibility (EPR)**
        - **National Dashboard on Elimination of Single Use Plastic and Plastic Waste Management**
        - **India Plastics Pact**
        - Project REPLAN
    - **Global:**
        - **European Union' Directive on Single-Use Plastics**
        - **Closing the loop.**
        - **The Global Tourism Plastics initiative**

Findings

- **Higher Level of Chemicals:**
    - Recycled plastics often contain **higher levels of chemicals**such as toxic flame **retardants, benzene and other Carcinogens,** environmental pollutants including brominated and chlorinated dioxins, and numerous endocrine disruptors **that can cause changes to the body's natural hormone**

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- Plastics contain more than 13,000 chemicals and 3,200 of them are known to be**hazardous to human health.**
- **Poisonous Pathways:**
  - There are three poisonous **pathways for recycled plastic material**to accumulate toxic chemicals,
    - Direct contamination**from toxic chemicals in virgin plastic.**
    - Substances like **plastic containers forPesticides,** cleaning solvents and others that enter the recycling chain and can contaminate plastic.
    - The recycling process, when plastics are heated.
  - **Increased Risk of Plastic Fires:**
    - With an increase in plastic stockpiles, **the risk of large fires at recycling facilities has gone up,**especially in those that hold **e-waste** plastics with used batteries.
      - A survey in the United States and Canada in 2022 found a record 390 fires in plastic recycling and waste facilities.
    - In the 12 months up to April 2023, large fires **have been reported at plastic recycling facilities in Australia,**Canada, Ghana, Russia, Southern Taiwan, Thailand and the United Kingdom and in Florida, Indiana, North Carolina of the United States.
  - **Increase in Plastic Production:**
    - Plastic production is **forecast to triple by 2060,**with only a **minimal increase in recycling**
    - Since the 1950s about **8 billion tonnes of plastic has been produced.**
      - Not only that just a tiny proportion (9%) of plastics are ever recycled, but also those that end up with higher concentrations of **toxic chemicals, multiplying their potential harm to human,**animal and environmental health.
    - **Implications:**
      - Plastic production, disposal and incineration facilities are most often located in low-income, **marginalized communities across the world,**which suffer from higher rates of **Cancer, Lung Disease and adverse birth outcomes** associated with their exposure to the toxic chemicals.

Recommendations

- Global plastic pollution can be reduced by 80% by 2040 if countries and companies make **deep policies and market shifts using existing technologies**and also shift to a circular economy.
- Plastics have **no place in a circular economy**and the only real solution to ending plastic pollution is to massively reduce plastic production.

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- There is a need for an **ambitious, legally binding Global Plastics Treaty** that accelerates and provides the **conditions needed for a just transition** away from dependence on plastic.
  - The Treaty **should promote safer, toxics-free materials** and reuse-based, zero-waste economies, creating new jobs to support these practices, protecting human and planetary health, minimizing resource use and delivering a just transition for workers and affected communities across the plastics supply and waste chains.

## Strengthening The Indian judiciary - A crucial pillar of democracy

Expressing concern over the pendency of cases, Chief Justice of India Ranjan Gogoi said that more than two lakh cases are in courts for 25 years, while over 1,000 cases have not been disposed of even after five decades. Speaking at a public function, Gogoi said though the judiciary faces criticism for the huge number of pending cases, it is not entirely responsible for the delay as the executive also has some responsibility in the justice delivery mechanism. He also expressed hope that the Centre will accept his proposal to raise the retirement age of high court judges to 65 years from the current 62. Meanwhile the Lok Sabha on Monday gave its nod to a bill to increase the strength of Supreme Court judges from the present 30 to 33. As of now, the Supreme Court has a sanctioned strength of 30 judges, plus the chief justice of India which makes it 31 judges.

**Present Status of pendency in Indian Judiciary:**

- As per the National Judicial Data Grid (NJDG), in 2018, 93 crore cases are pending in the subordinate courts, 49 lakhs in High Courts and 57,987 (Meanwhile it is 59,331) cases in Supreme Court.
- In the Supreme Court, more than 30% of pending cases are more than five years old while in the Allahabad High Court, 15% of the appeals have been pending since 1980s.
- A Law Commission report in 2009 quoted that it would require 464 years to clear the arrears with the present strength of judges.
- Eighteen months after the crime, a special court in Pathankot delivered its verdict on the Kathua case.
- Most cases in India, because of delays at both the police and judiciary levels take far longer.
- Across India's subordinate courts — the first port-of-call for most cases — more than a third of the 31 million cases have been pending for more than three years.
- In the High Courts, the pendency is even higher: half of all the 8 million cases in the High Courts have been pending for more than three years.
- The lower courts in West Bengal, Odisha and Bihar, in particular, struggle to dispose their cases. In all three states, nearly 50% of cases in the lower courts have been pending for more than three years.
- However, some state courts, though, dispose of cases more quickly.

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- In Punjab and Haryana for instance, less than 6% of all cases have been pending for more than three years.
- Overall, eastern states have much higher pendency rates compared to the western states of the country.

## Concerns

- **High Courts selecting the Judges:** In the lower Judiciary, there are civil judges and higher judicial service people. So far as civil judges are concerned, they are normally selected by the Public Service Commission but the Higher Judicial Service people are often selected by the High Courts. Judges are competent in deciding a dispute but may not be similarly competent in selecting the people to fill the vacancies.
- **The difference in the retirement age:** The current age of retirement for the Supreme Court judges is 65 years while for the High Court Judges is 62 years. This three-year difference often influences administrative decisions.
- **Poor 'Judge to People' Ratio:** India has 20 judges per million population, the lowest in the world. The highest being in America which is 107 per million population.
- **Vacancies:** In the lower courts, over 5,000 posts of judicial officers are vacant. In some cases, the examination to fill such posts is conducted through the state public service commissions, it seems that the commissions have failed to do their job.
- **Poor Quality of Judges:** Many-a-times, especially at the lower judiciary, Judges are asked to decide an issue about which they have no knowledge at all. It has been seen that most of the times, the judges ask the client about the related law and the statute.
- **Huge Pendency**: Close to 2.7 crore cases are pending in the trial courts. According to the 2012 report by National Court Management Systems, India is going to see a rise in the pendency of the cases to almost 15 crore cases in the next three decades.
- **Collegium, not doing its job:** The sanctioned strength of the Supreme Court was 31 including the CJI but India has hardly had 31 judges as the collegium did not fill up the vacancies in a timely manner. People in the collegium know which judge is going to retire on which date but still they do not take decisions in advance and thus vacancy remains.

## Role of the Executive

- It is the executive which has to take the ultimate decision as far as providing finances to the judiciary is concerned.
- It is the executive's duty to provide the necessary infrastructure to the judges and lay down certain standards.
- It is in the executive"s hand to increase the number of judges. For eg, in the recent case the number has been increased by making a simple amendment in the Supreme Court (Number of Judges Act), 1956.

## Who appoints judges to the SC?

- In exercise of the powers conferred by clause (2) of Article 124 of the Constitution of India, the appointments are made by the President of India.
- The names are recommended by the Collegium.

**Eligibility to become a Supreme Court judge**
- The norms relating to the eligibility has been envisaged in the Article 124 of the Indian Constitution.
- To become a judge of the Supreme court, an individual should be an Indian citizen.
- In terms of age, a person should **not exceed 65 years of age.**
- The person should serve as a judge of one high court or more (continuously), for at least five years or the person should be an advocate in the High court for at least 10 years or a distinguished jurist.

**Suggestions**
- **Strengthening E-Court System:**There is a need to implement a robust e-court system that can **streamline court processes, reduce paperwork, and improve efficiency.** This includes digitizing case records, enabling online filing of cases, e-summons, e-payment, and video conferencing for hearings.
  - The **Union Budget 2023-24**allocated **Rs 7,000 crore for the launch of the third phase of the e-Courts project.**
  - **The Centrally Sponsored Scheme (CSS) by the Department of Justice**also aims to develop **infrastructure facilities for the judiciary.**
    - The CSS enhances state government resources for constructing court buildings, digital computer rooms, lawyers'' halls, toilet complexes, and residential accommodations for judicial officers.
    - The fund-sharing pattern is**60:40 (Centre: State), 90:10 for 8 North-Eastern and 2 Himalayan States, and 100% central funding for Union Territories.**
    - Former CJI, N.V. Ramana suggested to develop a**National Judicial Infrastructure Authority of India (NJIAI)** for arranging adequate infrastructure for courts.
  - **Transforming the Appointment System:**Vacancies must be filled immediately, and **it is necessary to establish an appropriate timeline for the appointment of judges and to provide the suggestions in advance.**
    - Another significant element that can unquestionably aid India in developing a better judicial system is the **All India Judicial Services (AIJS).**
  - **Case Management Software:There is a need to** develop and deploy **case management software** that can help track case progress, automate administrative tasks, and facilitate better coordination among judges, lawyers, and court staff. **It can improve the overall efficiency of the judicial process.**
  - **Data Analytics and Case Prediction:**India can utilise **data analytics and artificial intelligence to analyse past judgments and predict case outcomes** to assist judges in making informed decisions, reducing inconsistencies and improving the quality of judgments.
    - However, it is vital to ensure that it**plays only a secondary role.**
  - **Public Legal Education: There is a need to**promote public legal education and awareness programs that can empower citizens to

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understand their rights and obligations, **reducing unnecessary litigation and promoting out-of-court settlements.**

- **Alternative Dispute Resolution Mechanism**: Use of mediation, conciliation and Lok Adalats will ease the burden on the mainstream judiciary.
- A case has to be ultimately decided; therefore, unlimited stays should be discouraged. The Indian Judiciary needs professional court managers for handling its administrative work.
- **Citizen Feedback Mechanism:** There is a need to establish **a feedback mechanism where citizens can provide feedback** on the judicial process and court experiences can help identify shortcomings and areas for improvement.

**Looking ahead**

There is a need to take a holistic and realistic view of the present situation of the Indian Judiciary. The Executive needs to ensure that every order it passes should be clear i.e. it needs to mention things like the authority and intention behind the order, remedy available, etc. A proper white paper on the entire state of the Indian Judiciary is needed. Once the white paper is released, a proper discussion by all the stakeholders (i.e.) the Supreme Court, High Courts, the central government, state governments, the Law Commission, academia and media, etc, is required.

## India's 'ruralisation', a worrying sign

- The **absence of official estimates and divergent research conclusions** have muddled the poverty debate, raising concerns about the reversal of India"s transformation over the past decade.
- Studies claimed that not only poverty has been on the **declining trend**, but **extreme poverty has been eradicated.**
- Developing societies usually shift towards the **modern from the subsistence sector** resulting in a virtuous cycle of rapid growth, urbanisation, rise in investments, productive employment and income, and poverty reduction.
- The concern is transformation may have **reversed in India over the past decade.**

### Lack of Investments in India

- India has experienced the **longest phase of private capex drag** in the post-independence era.
- Since 2011 despite multiple attempts to crowd them in through government investments and a surfeit of supply-side and post-pandemic bounties.
- **Share of capital formation:** The share of public capital formation has increased **to 9.5 % of GDP** in FY22 from **6.5 % in FY19**.
  - Whereas the **share of private fixed capital formation** has continued to decline to **8.4 % in FY22E** from 10.8 % in FY19.
- The Government capex's **crowding-in effect** on private was relevant during the 1980s.
  - Lately, the crowding-in effect has **failed** to generate a significant **multiplier effect**.

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- **Industrial Bank Credit Growth:** The plummeting of industrial bank credit growth in March 2023 to 5.7 % Year on Year (YoY), including **3 %** for **large industries** tells that revival of investment remains elusive.
- Corporates conserved their **profitability, investing in smart technology** amid rising uncertainty attributable to **multiple domestic and global shocks**.

*Unemployment Problem and Rising Ruralisation*

**Unemployment Problem**

- The lack of investments has **hit employment generation and income.**
- RBI's survey of urban households (4QFY23) indicates that both **employment and income situations** have improved since the Covid lows.
    - However, they remain **weaker than pre-pandemic** and **10 years** which resulted in a **worsening of per capita income**, amid the **rising cost of living.**

**Rising Ruralisation**

- **Reason:** Both the rising market share of large corporates and sluggish private capex have resulted in a **rise in urban unemployment** forcing a structural shift towards "ruralisation".
- **Agricultural Workforce:** Indian workforce dependence on agriculture has increased from **42.5 % (2018-19) to 45.5 % in 2021-22 (PLFS).**
- **Real Agriculture GVA (Gross value added):** It has grown at **3.8 % on a 3-year CAGR basis (FY23)**, higher than the **3.2 % real GDP growth.**
- **Increasing Agricultural Workforce:** The agriculture sector absorbed **10 million net additional workforces** since the Covid shock, whereas the **industrial sector and services** have retrenched **5.6 million and 2.5 million** respectively.
- This has changed the **composition of the workforce** and the **rise in surplus labour** has resulted in **low real wages.**

*Demand for Cereals Rising Again*

- A structural progression path should be characterized by **increased diversification** away from **calorie-intensive food items**.
- **Consumption of cereals:** India's monthly per capita consumption of cereals decreased by **1.7 %** annually from 12.9 kg (1993-94) to 10.4 kg (2011-12 (NSSO)).
    - However, this trend has reversed, showing a **rising structural trend** (3.3% p.a) and a 2.2% per capita **real spending on cereals** in FY21, up from **-0.8% in the late 2010s.**
- This suggests the decline in **calorie intake till mid-2010** may have also reversed.

**Industrial sector converged with agriculture:**

- Since 2012, the Industrial production growth (IIP) has decelerated to **2.1 %** on a 10-year CAGR, lower than a decade back.
- It is also **lower than foodgrain production at 2.3 %** on a 10-year CAGR.
- This indicates a convergence between the **modern sector (industrial production)** and the **subsistence sector (foodgrain production).**

**Impact on Multiple Indicators of this shift**

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- **Sales of two-wheeler and passenger vehicle sales** volumes are now **30 % and 32 %** lower than the 2018 peak respectively,
- **Growth in tractors** has gone down but is better than **two-wheelers and passenger vehicles**,
- **Decline in sales of heavy commercial vehicles**, reflecting the state of capital formation, and
- **Volume growth for HUL** has halved to 3.5 % from a decade ago.

*Fading Transformation Amid De-globalisation*

**Comparing India, the US and the EU**

- **Industrial production (IP)** growth in the United States has **improved from -0.3 %** during 2000-2012 to **+1.1 %** during 2012-2022.
- In the European Union it increased from **0.2 % to 1.1 %**.
- India's industrial growth fell to a **10-year average of 2.1 %**, compared to **7.7 % during 2000-12.**
- Thus, indexed to 1991, India's IIP relative to the EU and the US increased to **290 and 240** by 2012 respectively.
- As the growth differential narrowed the **incremental rise** had been modest.
- India is facing a **multidecade high unemployment rate** compare to the US which is at a **57-year low.**

**India needs to shun complacency:**

- No matter what criterion India choose poverty declined sharply **between 1993-94 and 2011-12** with a significant acceleration during the **faster-growth period of 2004-05 to 2011-12.**
- However, current claims attribute the poverty decline to factors like **free-food distribution, increased MNREGA allocation**, **and a strong agriculture sector**, overlooking the declining structural progression.

**Household situation and elusive private capex:**

- The 4QFY23 real GDP growth at **6.1 %** is a positive surprise, it continues to depict a frail household situation and elusive private capex.
- Decline in bank lending to industries, and the **rise in fixed capital formation/GDP** has come from **abnormal clustering of government outlay** in 4QFY23.

India''s lack of investments, prolonged private capex drags, rising ruralization, and increasing demand for cereals indicate the need to shun complacency and address the frail household situation and elusive private capex.

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## Is India missing the graphene bus?

- Graphene to materials is as important as **Artificial Intelligence (AI) for software** and **quantum computing for computers**.
- These emerging technologies will change the existing **human-machine interface** in the next couple of decades.
- India is among the **leaders in AI** and a potential challenger in **quantum computing** but India needs to catch up in the area of graphene.

### What is Graphene?
- **Definition:** Graphene is the world"s **thinnest, strongest,** and most electrically and thermally conductive substance.
- **Structure:** It is a single layer (monolayer) of carbon atoms securely linked in a hexagonal honeycomb lattice.

### Properties
- Graphene conducts electricity **better than copper.**
- It is **6 times lighter and 200 times stronger** than steel.
- It absorbs **only 2% of light** because it is almost **perfectly transparent**.
- It is impermeable to gases, even those as light as **hydrogen and helium**.
- Graphene is **stiffer and stronger than diamond.**

### Potential of Graphene
- Graphene has the potential to transform **electricity, conductivity, energy generation, batteries, sensors and more.**
- Also, when graphene is added to other materials even in small quantities it **produces composite materials** with dramatically transformed qualities.

### Uses of Graphene
- Graphene composites are used in **aerospace, automotive, sports equipment and construction.**
- Graphene is used for high-performance batteries and super-capacitors, touchscreens, and conductive inks.
- **Graphene sheets** are used in biomedical applications because it is being hydrophobic and repel polar solvents.
- **Graphene-based sensors** are used for **environmental monitoring, healthcare and wearable devices.**
- **Graphene oxide membranes** are used for **water purification and desalination**.
- **Graphene-based masks** were made during COVID.
- **Graphene coatings** also act as protective coatings with **superior chemical, moisture, corrosion, UV, and fire-resistance properties.**
- Graphene aerogel is used in **supercapacitors, lithium-ion batteries, environment purposes, solar or fuel cells, etc.**

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**Mechanical**
100x stronger than stell, stiffer than diomand

**Electrical**
%60 greater conductivity than copper

**Transparent**
Circa. %98 optical transmission

**GRAPHENE**

**Thermal**
5x conductivity of Al

**Impermeable**
Vacuum tight to helium gas

**Lubricating**
Very low surface shear

*Graphene- Importance, Market & Research*
**Importance of Graphene**

- Graphene is important for **defence and aerospace** as well.
- Graphene's exceptional strength makes it a promising material for **armour and ballistic protection.**
- Graphene has the potential to **absorb and dissipate electromagnetic waves**.
    - Due to this it is valuable for developing **stealth coatings and materials** that reduce radar signatures and electromagnetic interference.
- It is **highly sensitive to environmental changes** which makes it an excellent candidate for sensing **chemical and biological agents, explosives, radiation, and other hazardous substances.**

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- Graphene-based materials can protect us against **chemical and biological attacks.**
- **Better energy storage and electronics properties** make graphene attractive in **defence and aerospace** as well as in **civil and commercial applications.**

## Graphene Market Size

- The global graphene market size was valued at **$175.9 million in 2022**.
    - It is expected to increase at a CAGR of **46.6%** between **2023 and 2030.**
- Graphene was discovered in **2004**, it was difficult to produce **high-grade large-scale graphene.**
- Over **300 companies** are producing graphene or its derivatives and a minimum of one product related to graphene was launched every week in 2022.

## Graphene Research

- Leading graphene research countries are **China, the U.S., the U.K., Japan, South Korea, Russia, and Singapore.**
- Till 2012, the **United States** dominated **graphene-related patent filing**.
- **South Korea and China** matched the US between 2013 to 2016.
- China filed **218 patents** alone while the other leading countries together filed **79 patents** in 2018.
    - India filed **8 patents** in 2018.

## Graphene Production

- **China and Brazil** are global leaders in the **commercial production of graphene.**
- India produces graphene about **one-twentieth and one-third** of China and Brazil's production respectively.

## *Graphene Manufacturers and Researchers in India*

- India has made **more development** than many other countries.
- Several years ago, the **Centre for Nano Science and Engineering at IISc Bangalore collaborated with KAS Tech** to develop a **graphene-based technology.**
- In India, certain **start-ups and overseas subsidiaries** are developing graphene or graphene derivatives.
- Notably, **Tata Steel** has succeeded in **producing graphene** (domains of 50 micrometres in size) and **extracting atomic carbon** from steel surfaces via annealing.
    - It has also **combined graphene with discarded plastic items** to repurpose them as new.
- India''s specialisation will be **graphene-based innovation**.
- It discovered how graphene oxide-based preservative-loaded wraps may extend **the shelf life of fruits and vegetables.**
- **Log 9,** an IIT Roorkee-incubated company, has patented a method for **graphene-based ultracapacitors**.
- **RF Nanocomposites**, an IIT Kanpur-incubated company, has developed **EMI shielding** and stealth technology utilising **graphene-based nanotubes**.
- The establishment of the **India Innovation Centre for Graphene** in Kerala was a commendable move in this regard.

- The **Digital University Kerala** is implementing it in collaboration with Tata Steel and C-MET, Thrissur.
- The Centre must serve as a focal point for **large-scale graphene innovative activities**.

## Role of Government

- Governments play a critical role in the Graphene ecosystem.
- In its 13th Plan, China designated **graphene as a priority**.
- In 2013, Europe established the **Graphene Flagship** with **$1 billion in funding.**
- India can establish a national graphene mission, similar to the **National Green Hydrogen Mission.**

India needs to be among the graphene leaders. Due to the high cost-to-volume ratio for high-grade graphene, its manufacturing may become regionalized, similar to how semiconductors are produced now. Midway through the 1990s, India missed the semiconductor opportunity but now is the moment to capture the graphene opportunity.

## Why meritocracy matters for countries like India and China?

- Broadly, our chapters **suggest two trans societal and trans historical reasons** why people think that meritocracy matters, that is, why **society should be organized along meritocratic lines**. We can label these efficiency reasons and ethical reasons.
- The effective cultivation and deployment of talent and the implementation of **good government and policy** are often thought to be **critical factors for successful economic growth** (though as far as we know, there has been little empirical testing of this conventional wisdom). So, **meritocracy is widely considered important to China and to India because of its implications for economic growth** and other associated positive outcomes, such as poverty reduction.
- At this time, there are hundreds of millions of people in China and India whose opportunities are restricted by systems of **inequity produced by history**, as well as the inadvertent result of more recent, well-intentioned policies with deleterious side effects. **When given the opportunity,** women typically perform as well as men across a range of educational and occupational measures, villagers as well as city dwellers, and students at non-elite colleges as well as students at elite schools. But **these groups are not always given that opportunity, and this is widely seen** as having a negative impact on the economy.
- Turning to the political, in China and India, as elsewhere, promoting good governance by selecting worthy and talented people to serve also remains a work in progress. **Poor operationalization of merit in the political system may contribute to lower growth and greater inequality**. A system in which rewards are seen as accruing disproportionately to the few, selected on criteria that appear arbitrary, and cementing status quo hierarchies, may **also generate**

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**social discontent**. This **in turn could have consequences for social and political stability**.

■ In the economic realm, the supposed advantages of meritocracy are often contrasted with one specific alternative system for allocating opportunities, that is, privilege, which can be hereditary, socioeconomic, cultural, racial, or some combination. As we noted previously, in the political realm, meritocracy is also **often contrasted to one specific alternative: democracy**. Bell points out (although it is not central to his argument) that arguments about efficiency can actually be used in support of (and indeed against) either system. **The dichotomy between merit and privilege** or between merit and democratic selection is often overstated; the two poles are linked in practice in complex ways. Many arguments in support of meritocracy as against privilege or other forms of selection are founded on arguments not about efficiency but about ethics.

■ They are not about how to build a successful society but about how to build a good society. **Arguments that draw a contrast between merit and privilege are often implicitly or explicitly ethical arguments about fairness**.

■ In a system where privilege determines opportunity, limiting the impact of privilege by implementing meritocracy often means expanding diversity. Arguments about diversity recur in different contexts. One argument, familiar to Americans, is that diversity is desirable as a way to redress past injustice. Then there is the idea that diversity is desirable as a way to ensure equality of **opportunity**. Both these arguments are ethical arguments, but **they are slightly different: the first is oriented to the past, the second to the present.**

■ **A third argument for diversity is instrumental** and therefore actually belongs to the category of efficiency reasons. That is, promoting more diverse representation in the leadership of a government, or a corporation, or any other organization will make that organization more effective because it will incorporate a wider range of views and permit a fuller understanding of the issues.

■ **Barriers to Meritocracy: Latent and Engineered**

■ **Contemporary America is far from the first or only society to have explored the advantages of meritocracy**. Efficiency and ethical arguments have been made in other contexts. Nor is the idea that meritocracy is difficult unique to contemporary America. Much of the history of meritocracy in these different contexts is a story of the challenges to it. **We can think about the difficulties of making meritocracy in two broad categories: latent and deliberate (or engineered).**

■ By latent difficulties we refer to aspects of a society that undermine efforts to recognize merit. In India, the most systemic latent obstacle to meritocracy is the system of varnas or castes which evolved from Vedic times (1500–500 bce) on the **Indo-Gangetic plain.** Historians debate the extent to which the more rigid caste system of twentieth-century India was produced by the colonial period rather than surviving as a legacy from an earlier period.

■ But the consequences of the system for meritocracy in pre-modern as well as modern times are in little doubt.Although merit could theoretically be rewarded by new opportunities within the limits of one's caste, and in a very small number of cases castes moved up or down the hierarchy of castes in toto, by the colonial period castes were **ordered such that opportunities** based on merit were chiefly

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confined within caste boundaries. This limitation persists in different forms today. Babu, Prasad, and Kapur (chapter 12 in this volume) point out those long-standing emphases on the strictures of caste have led to a mindset that is an insidious latent barrier to meritocracy in India. Subramanian (chapter 8 in this volume) refers to a similar phenomenon when she describes an "upper class claim to merit," in which members of the elite confuse an actual "aristocracy of privilege" for an imagined "aristocracy of talent**." The relationship between caste membership and advancement is complex, of course. In fact, membership in a caste might even be an enabler of political office, regardless of merit, due to caste members voting en bloc.**

■ However, such **politicization of caste has not translated into economic prowess**. Iyer et al. show that, **as recently as 2005, scheduled castes and scheduled tribes remained significantly underrepresented (relative to their share in the population) in the ownership of private enterprises.**

■ In contemporary China, the divide between urban and rural is perhaps the closest analog to the caste system in premodern and modern India (the divide between the majority Han ethnicity and the minority ethnicities might be a close second). Despite remarkable poverty-reduction efforts, rural people today still have inferior access to educational and occupational opportunities and are underrepresented in political leadership. Historical patterns were reinforced by policy choices made in the Maoist era. Thus geographic contingency can represent **another kind of latent barrier to meritocracy.** Though it is hard to imagine any political leader today proposing active policies to repress the opportunities of rural people, rural talent remains disadvantaged**.** So, this is another latent difficulty in implementing meritocracy.

■ A different kind of challenge to meritocracy takes the form of deliberate or engineered interference in otherwise meritocratic selection systems to achieve other goals. Even a society that aspires to meritocratic selection and with a meritocratic system in place, regardless of how merit is defined, may decide that **pure meritocratic selection is not ideal and interfere with selection in some way**.Various tools are available to interfere with meritocratic systems; US affirmative action policies offer a well-known example.

## Manipur unrest

Violent protests and clashes erupted in Manipur as the Manipur High Court directed the State Government to grant Scheduled Tribe (ST) status to the Meitei community based on a 10-year-old recommendation.

**Manipur's Ethnic Composition**
■ Geographical features and the location of the State have a significant influence on the problems faced by Manipur.
■ There are 16 districts in Manipur and the State is said to be divided into "valley" and "hill" districts.
■ The Imphal Valley lies at the centre of the State and is surrounded by hills.

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- Four highways act as the access points to the valley from the rest of the region out of which two highways are regarded as the "lifelines for the State".
- The valley accounts for about 10% of Manipur's landmass and is dominated by the non-tribal Meitei. People belonging to the Meitei community account for over 64% of the State population and yield 40 out of the 60 Members of the Legislative Assembly (MLAs) of the State.
- Meanwhile, the hills that account for close to 90% of the geographical area of the State are inhabited by about 35% recognised tribes but are represented by only 20 MLAs.
- The majority of the Meiteis are Hindus followed by Muslims and the 33 recognised tribes who are broadly categorised as "Any Naga tribes" and "Any Kuki tribes" are mainly Christians.

## Genesis

- The valley districts of Thoubal, Bishnupur, Kakching, Imphal East and Imphal West were part of the erstwhile kingdom of Kangleipak. The kingdom of Kangleipak was ruled by the Ningthouja dynasty.
- According to many historians, the tribal patches outside the valley were also part of the kingdom. However, such claims are disputed by the tribes, especially the Naga tribes.
- The kingdom of Kangleipak, which was a British protectorate, was repeatedly attacked by the Naga tribes from the northern hills.
- In order to protect the valley, the British political agent in Manipur is said to have brought the Kuki-Zomi from the Kuki-Chin hills of Burma to make it a buffer territory between the Meiteis and the Nagas.
- The Kukis, similar to the Nagas, were fierce headhunting warriors and the Maharaja provided them land along the ridges, where they could act as a shield for the valley.

## Meitei Community's Demands for ST Status

- Since 2012, there has been a constant demand led by the Scheduled Tribes Demand Committee of Manipur (STDCM) for granting the Scheduled Tribe (ST) status to the Meitei community.
- The Meetei (Meitei) Tribe Union had filed a petition before the Manipur High Court and had argued that the Meitei community was once recognised as a "tribe" before the merger of the princely state of Manipur with the Union of India in 1949 and that it lost its identity as a tribe after the merger.
- Petitioners had further argued that the ST status must be extended to the community in order to preserve the community and save their ancestral land, tradition, culture and language. According to STDCM:
  - The Meitei community has been victimised without any constitutional protection.
  - They have been gradually marginalised in their ancestral land.
  - And the population of the Meitei community has reduced from 59% of the total population of Manipur in 1951 to 44% as per 2011 Census data.

## Manipur High Court's Judgement

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- The Manipur High Court on April 19, 2023, asked the Manipur government to submit a 10-year-old recommendation to the Union Tribal Affairs Ministry for the inclusion of the Meitei community in the ST list within four weeks.
- The High Court referred to the Union Tribal Ministry's letter to the State government in May 2013 which had sought recommendations along with the latest socio-economic survey and ethnographic report.

**Opposition by other tribal groups**
- The demand for ST status for the Meitei community has been opposed by the other tribal groups of the state.
- These tribal groups opine that the individuals of the Meitei community already have a demographic as well as a political advantage. They further argue that the Meitei community is more advanced than the tribal groups academically and in other aspects.
- According to the various tribal organisations, granting ST status to the Meiteis would result in the loss of employment opportunities and would also allow Meiteis to acquire land in the hills which would ultimately push the tribals out.
- Additionally, groups like the All Tribal Students' Union of Manipur also argue that the Manipuri language of the Meiteis is included in the Eighth Schedule of the Constitution and that various sections of the community are already enjoying various benefits associated with the Scheduled Castes (SC) or Other Backward Classes (OBC) status.

**Recent Unrest in Manipur**
- Following the April 19th directives of the Manipur High Court, the All Tribal Students' Union of Manipur (ATSUM) called for a "Tribal Solidarity March".
- The March was organised in protest against the demand for the inclusion of the Meitei community in the ST category. However, violent clashes broke out at various places during the march.
- The situation in Manipur turned extreme and violent which saw the deployment of the Indian Army and other central police forces.
- The Manipur government also authorised all District Magistrates to issue "shoot at sight orders" in "extreme cases" in order to control the situation.

**Other reasons for the recent unrest**
- The divide between the Meiteis and tribals such as Kukis on various issues has aggravated in recent years.
- Displeasure over the state government's notices which claim that the 38 villages in the Churachandpur-Khoupum Protected Forest area are "illegal settlements" and its residents are "encroachers" and the eviction drive that followed the notices led to serious clashes.
- Concerns and displeasure over the first delimitation process in the state since 1973.
- The widespread refugee crisis in the State on account of a military coup in Myanmar. Meitei leaders have alleged that there has been a sudden mushrooming of villages in the Churachandpur district. The Kuki-Zomi tribesmen of both countries are bound by strong links of ethnicity, customs, language, and dress.

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■ Pro-government groups in the State believe that a few tribal groups with vested interests are trying to scuttle the government's battle against drugs.

## Kuki-Meitei Divide

■ Ethnic conflict between the hill communities and the Meiteis has continued to exist ever since the time of the kingdom of Kangleipak.

■ These tensions and conflicts escalated during the 1950s with the rise of the Naga national movement and the demands for an independent Naga nation.

■ The Naga insurgency was countered by the rise of insurgent groups among the Meiteis and Kuki-Zomi.

■ In the 1990s, as the National Socialist Council of Nagaland (Isak-Muivah) (NSCN-IM), which is one of the largest Naga groups, pushed harder for self-determination, the Kuki-Zomi groups began to militarise.

■ The Kukis later launched their own movement for "Kukiland", which demanded the creation of a separate state within India.

■ Although the Kukis once were the protectors of the Meitei people, the "Kukiland movement" created a rift between the communities.

## Supreme Court's Views

■ The Supreme Court has regarded the Manipur crisis as a "humanitarian problem" and expressed concerns about the loss of life and property.

■ The apex court had further noted that it is the President who has the power to designate a community as Scheduled Caste or Scheduled Tribe and not the High Court.

■ The Chief Justice of India (CJI) has urged the Centre and the Manipur government to undertake efforts to protect the people.

## Centre's stand

■ The union home minister said that the order passed by the Manipur High Court will be studied and discussed with all stakeholders and appropriate decisions will be taken after consultation.

■ The Indian Army has deployed Heron Unmanned Aerial Vehicles (UAV) and helicopters to increase surveillance on the situation in Manipur and along the Indo-Myanmar Border.

### Good and bad: On India and artificial intelligence

**Generative AI** is a type of AI system that can create new content or data that resembles human-made content, such as text, images, music, code, etc. It works by using neural networks to learn from large amounts of data and then generate outputs based on the patterns and rules it has learned.

Their widespread adoption really embellished their capabilities, leading to awe, then worry. OpenAI's **ChatGPT chatbot** mimics intelligence very well; today, it has become

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synonymous with the abilities of generative AI at large. In the last few years, AI models backed by neural networks trained on very large datasets and with access to sufficient computing power have been used to do good, such as finding new antibiotics and alloys, for clever entertainment and cultural activities, and for many banal tasks, but it has caught attention most notably with its ability to falsify data. The world is past being able to reliably differentiate between data that faithfully reflects reality and data made to look that way by bad-faith actors using AI.

### Benefits of Generative AI

- **Content Creation:** Generative AI enables the automated creation of various types of content, such as text, images, videos, music, and more. This can significantly speed up the content generation process for industries like advertising, entertainment, and marketing.

- **Personalization:** Generative AI can be used to create personalized experiences for users. By analyzing user preferences and behaviour, generative AI systems can generate tailored recommendations, product suggestions, and customized content, enhancing customer satisfaction and engagement.

- **Creative Assistance**: Generative AI tools can assist and inspire creative professionals in their work. Artists, designers, and writers can use generative AI to generate ideas, explore new possibilities, and overcome creative blocks. It can act as a collaborator, offering fresh perspectives and aiding in the creative process.

- **Data Augmentation:** Generative AI can generate synthetic data that closely resembles real data. This is particularly useful in machine learning applications where a large amount of labelled data is required. Synthetic data can be generated to augment existing datasets, helping improve the performance and generalization of machine learning models.

- **Simulation and Training:** Generative AI can be used to simulate realistic scenarios for training purposes. For example, in industries like autonomous vehicles or robotics, generative AI can create virtual environments to train algorithms and test systems without the need for physical resources or risking safety.

- **Problem Solving**: Generative AI can be applied to problem-solving tasks, such as generating new drug compounds, optimizing supply chain logistics, or creating efficient designs. By exploring vast solution spaces, generative AI algorithms can propose novel solutions and accelerate the discovery process.

- **Virtual Characters and Agents:** Generative AI can bring virtual characters and agents to life. By imbuing them with generative capabilities, they can exhibit natural language understanding, interact with users, and respond dynamically to different situations. This has applications in virtual assistants, chatbots, gaming, virtual reality, and more.

- **Art and Entertainment:** Generative AI has opened up new avenues for artistic expression. It can generate unique artwork, compose music, produce realistic animations, and even generate entire stories or scripts. This fusion of human creativity and machine intelligence has led to exciting possibilities in the realm of art and entertainment.

### Threats from Generative AI

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■ **Hallucinations:**These are the errors that AI models can make because they are not human and rely on data and training to provide answers. Sometimes, generative AI models can produce outputs that are nonsensical, inaccurate, or misleading.

■ **Deepfakes:**These are the synthetic media that generative AI models can create by manipulating or combining existing images, videos, or audio. Deepfakes can be used for malicious purposes such as spreading disinformation, impersonating people, or blackmailing.

■ **Data Privacy:**Generative AI models require large amounts of data to learn and generate outputs. However, this data may contain sensitive or personal information that can be compromised or misused by third parties. Generative AI models may also collect user data without their consent or knowledge.

■ **Cybersecurity:**Generative AI models can be used by hackers to create new and complex types of malwares, phishing schemes, or other cyberattacks that can evade conventional security measures. Such attacks can have serious consequences such as data breaches, financial losses, or reputational damage.

■ **Copyright issues:**Generative AI models can create content that resembles or copies existing human-made content, such as text, music, or art. This can raise ethical and legal questions about the ownership, attribution, and rights of the original and generated content.

### How can India Harness the Benefits of Generative AI?

■ **Healthcare:**Generative AI can help diagnose and treat diseases more accurately by analyzing medical images and data. It can also help predict patient outcomes and take preventive measures.

■ **Education:**Generative AI can help create personalized learning content and assessments for students based on their abilities and interests. It can also help teachers with grading, feedback, and curriculum design.

■ **Agriculture**: Generative AI can help optimize crop yield and quality by generating recommendations for irrigation, fertilization, pest control, and harvesting based on weather, soil, and plant data.

■ **Manufacturing:**Generative AI can help design and produce new products and services that meet customer needs and preferences by analyzing market trends and consumer behavior. It can also help improve efficiency and quality control in production processes.

■ **Entertainment:**Generative AI can help create new forms of art, music, literature, and games that can entertain and inspire people. It can also help personalize content recommendations and advertisements based on user preferences.

### India"s Initiatives for Generative AI

■ **Launching the Generative AI Report: INDIAai,**the Government of India"s National AI Portal, conducted numerous studies and hosted three roundtable discussions with some of the most prominent voices in Generative AI, AI Policy, AI Governance and Ethics, and academia to examine the impact, ethical and regulatory questions, and opportunities it brings to India.

■ **Joining the Global Partnership on Artificial Intelligence (GPAI):**In 2020, India joined forces with 15 other countries to form the GPAI. The purpose of

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this alliance is to establish frameworks for the responsible utilization of emerging technologies.

- **Fostering an AI ecosystem within the country:** The Indian government has been dedicated to fostering an AI ecosystem within the country by investing in research and development, supporting startups and innovation hubs, creating AI policies and strategies, and promoting AI education and skilling.
    - **National Strategy for Artificial Intelligence:**
        - The Government has published the National Strategy for Artificial Intelligence with the objective of developing an ecosystem for the research and adoption of Artificial Intelligence.
    - **National Mission on Interdisciplinary Cyber-Physical Systems:**
        - Under this Mission, Technology Innovation Hubs (TIH) has been established on Artificial Intelligence and Machine Learning at the Indian Institute of Technology (IIT) Kharagpur, which aims to provide the state-of-the-art training and capacity building for the creation of next-generation scientists, engineers, technicians, and technocrats in the field of Artificial Intelligence.
    - **Artificial Intelligence Research, Analytics and Knowledge Assimilation Platform:**
        - It is a **Cloud computing** platform, aiming to make India a pioneer amongst emerging economies with regards to AI and transform sectors like education, health, agriculture, urbanization and mobility.

*Overcoming the Challenges posed by Generative AI*

- **Developing a clear and comprehensive regulatory framework** that defines the purpose, scope, and principles of generative AI regulation. The framework should balance the protection of individuals from potential harms with the promotion of innovation and economic growth.
- **Building an accurate and fair liability framework** that assigns responsibility and accountability for the actions and outcomes of generative AI systems. The framework should consider the roles and obligations of different stakeholders, such as developers, providers, users, and regulators.
- **Incorporating essential regulatory facets such as transparency,** accountability, privacy, security, ethics, and human oversight. These facets should ensure that generative AI systems are trustworthy, reliable, and respectful of human rights and values.
- **Investing in research and development of generative AI technologies** that can address India''s specific needs and challenges. India should leverage its strengths in data science, engineering, and entrepreneurship to create innovative solutions for various sectors and domains.
- **Fostering collaboration and cooperation** among different stakeholders, such as government, industry, academia, civil society, and international partners. India should engage in dialogue and exchange of best practices with other countries and regions that are leading in generative AI development and regulation.

Generative AI is a powerful and promising technology that can bring many benefits to India and its people. However, it also poses many challenges and risks that need to be addressed by effective and responsible regulation. India should adopt a proactive and balanced approach to generative AI implementation that ensures its safety, security, and ethical use.

## Why our export mix is changing?

- The fiscal year (FY) 2023 trade data unveils **two trends** in **Merchandise exports of India**.
- First is the **decline in the share of pharmaceuticals and labour-intensive sectors** such as apparel, leather, and marine products.
- Second is a modest **increase in the share of electronics and machinery exports**.
- Two trends will have a **profound impact** as they become more pronounced.

### *India"s Declining Global Market Share in Key Sectors*

1. **Decline in India"s Global Market Share**
   - Indian presence in the global market has witnessed a decline in sectors such as **apparel, leather, shoes, and marine products.**
   - This decrease can be attributed to concerns primarily related to the **quality of goods rather than pricing issues**.
2. **Apparel Sector Challenges**
   - The apparel sector has been impacted significantly by this decline.
   - Exports in FY2023 fell below the levels achieved in FY2018, indicating a worrisome trend.
   - **Factors contributing to this setback:** challenges associated with importing high-quality fabric, inadequate attention given to non-cotton fashion apparel (which accounts for 70% of global trade), an inverted duty structure, and labour-related concerns.
   - Resolving these issues is of paramount importance, considering the apparel industry"s role as a **major job creator**.
   - The Apparel Sector must address **sustainability concerns** that are becoming increasingly critical.

### *Quality Challenges in Pharmaceutical, Aquaculture, and Tea Sectors*

1. **Quality Challenges in the Pharmaceutical Industry**
   - The pharmaceutical industry faces significant quality challenges, where even a **single instance of poor-quality cough syrup** can greatly impact **reputation and orders.**
   - To maintain India"s position as the "**Pharmacy of the world,**" it is important to prioritize resolving quality issues.
   - Additionally, reducing **dependency on imports of Active Pharmaceutical Ingredients (APIs) and Key Starting Materials (KSMs)** from China is essential.

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- **Rebuilding domestic manufacturing capabilities** will enhance the industry''s resilience.

2. **Quality Challenges in Aquaculture**
   - Quality issues also affect Indian aquaculture products like shrimp and prawns.
   - Many countries reject these products due to the **presence of Salmonella**.
   - This highlights a need for a **robust internal system**.
   - **Quality checks within India** will prevent rejections in foreign markets, preserving the reputation of Indian products and avoiding order losses.

3. **Quality Challenges in Tea Sectors**
   - The tea sector requires **deregulation to foster growth.**
   - **Allowing more players to cultivate and sell tea** will create a competitive environment.
   - Quality issues have impacted **Indian tea exports**, with reports of consignments being held due to **phytosanitary issues and excessive pesticide levels**.
   - Addressing these concerns is important to **enhance the reputation of Indian tea** in global markets.

4. **Quality Challenges Across Sectors**
   - To regain **market share and maintain a positive global perception**, the industry must tackle quality challenges across various sectors.
   - Ensuring **stringent quality control measures** and addressing specific issues will help restore confidence in Indian products.

5. **Improving Market Share in Key Sectors**
   - India has witnessed improvements in market share for sectors with initially **low global presence.**

6. **Growth in Electronics, Telecom, Mobile Phones, and Machinery**
   - Two key sectors that have shown a higher share in global trade are **Electronics, Telecom, Mobile Phones, and Electrical Equipment**, as well as Machinery.
   - This is an encouraging development considering the significant role these product groups play in global trade, which surpasses $6 trillion.
   - Historically, **India''s share in these sectors has been low**, but there has been **gradual and decisive improvement** in recent years.

**Addressing the challenges:**

1. **Changing Shares and Focus on Deep Manufacturing**
   - In 2015, India''s overall share in global merchandise trade was **1.8 per cent.**
   - However, its share in machinery and electronics was **merely 0.75 per cent and 0.4 per cent,** respectively.
   - Over the course of seven years, there has been a marginal yet **significant improvement** in these shares.
   - India should **prioritize deep manufacturing** instead of relying solely on **assembly-led operations,** to continue this improvement.

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2. **Mastering Component Manufacturing**
   - The focus should shift towards **mastering the manufacturing of components** rather than mere assembly.
   - **Example:** the **Production Linked Incentive Scheme** should support the **production of Electric Vehicle (EV) cells, Photovoltaic (PV) cells, and Printed Circuit Board Assembly (PCBA).**
   - This emphasis on component manufacturing will contribute to **India"s overall manufacturing capabilities.**

3. **Facilitating Industrial Labs and Reducing Dependence**
   - To reduce **dependence on imported machinery**, the government may consider introducing a **new PLI scheme** to facilitate the establishment of industrial labs for reverse engineering industrial machinery used in various sectors.
   - This initiative would prove beneficial in **textiles, mining, metalwork, and agriculture**.

## Challenges and Opportunities
- India has observed an **increased share** in the export of **petroleum products, rice, and sugar.**
- However, careful navigation is required concerning **World Trade Organisation (WTO) cases** related to subsidised rice and sugar exports.
- The **iron and steel,** as well as **aluminium sectors**, have shown an upward trajectory, but challenges remain due to the **imposition of carbon taxes by the European Union (EU) and other countries.**

## Importance of Petroleum Products
- Petroleum products have emerged as a **crucial driver of overall merchandise exports of India**, with significant growth witnessed in FY2023.
- However, excluding petroleum products, India"s exports **experienced a decline** during the same period.
- This highlights the **importance of diversifying the export basket**.

Resolving quality issues and focusing on deep manufacturing should remain top priorities for the government and the industry. These measures will ensure India"s competitiveness in the export market, even in the face of challenging global economic conditions.

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## 5 years down the line, 'Khelo India' striving to revolutionise sports ecosystem By PBNS

- The Khelo India Mission has completed 5 years. It is a GOI program aimed at providing international standard sports infrastructure and promoting fitness for citizens.
- The ultimate goal is to make India a sporting nation, and the program has been running since 2018, supporting over 2500 athletes in different disciplines.

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- The success of Khelo India and its challenges will be discussed in this edition of the article.
- Khelo India is a national program launched by the Indian government in 2018 with the aim of promoting sports and fitness in India.
- The program seeks to provide sports infrastructure of international standards to budding athletes, promote a holistic approach towards fitness for citizens, and ultimately make India a sporting nation.
- It focuses on encouraging and promoting sports at the grassroots level and providing access to sporting facilities and infrastructure to all citizens, regardless of their economic background or geographical location.
- It also aims to develop and train coaches who can provide high-quality coaching and training to athletes at the grassroots level, identify young talent and provide financial assistance.
- The program also emphasizes the importance of teamwork, socialization, and the participation of girls in sports.

## Achievements of the program

### (1) Support to Young Athletes
- 2500 young athletes are being supported with Rs. 6.28 lakhs annually under the scheme and are being identified to represent India at international competitions.
- Successful athletes are further being inducted into Target Olympic Podium Scheme (TOPS) for higher levels of training. 110 Khelo India athletes are part of TOPS.

### (2) Organizing Competitions
- To ensure competition opportunities for young athletes, 5 Khelo India Youth Games with 43K participants have been organized.
- Khelo India Leagues are held throughout the year, with a special focus on girl athletes. More than 1.25 lakh girls have participated in it.

### (3) Sports Infrastructure Created
- To ensure sports infrastructure availability in remote corners of India, 946 Khelo India Centers have been set up.
- By August 15, 2023, 1000 KICs are expected to be operational, giving every district in India a sports facility for the training of grassroots-level athletes.

### (4) Indigenous Games Inducted
- A special emphasis on indigenous games under Khelo India has ensured the popularity of India's traditional sporting disciplines like Gatka, Thang-Ta, Mallakhamb, Kalaripayattu and Yoga.
- These games have also been included in KIYG to give athletes an impetus to practice them.

## Significance
- **Promoting the importance of sports and fitness:** The program promotes the importance of sports and fitness in one's life, as playing sports inculcates team spirit, and develops strategic and analytical thinking, leadership skills, goal setting, and risk-taking.
- **Improving confidence and social skills:** Participation in the program has helped athletes improve their confidence, teamwork, leadership skills, and

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socialization. The program emphasizes the importance of teamwork, providing opportunities for children to learn how to work with others and manage different personalities, find their way as leaders etc.

■ **Encouraging the participation of girls in sports:** The program emphasizes the participation of girls in sports, providing them with a great opportunity to showcase their talents.

■ **Promoting diversity and inclusivity:** The program's emphasis on indigenous games and the participation of girls in sports is also a significant step in promoting diversity and inclusivity in sports.

■ **Creating world-class sports infrastructure:** The program aims to create world-class sports infrastructure in the country, including training facilities, stadiums, and sports complexes. This will help create a conducive environment for athletes to train and compete at the highest level.

■ **Promoting sports for development and peace:** The program aims to promote sports for development and peace by using sports, physical activity, and play to attain specific development and peace objectives.

## Challenges

■ **Lack of awareness and participation:** One of the significant challenges of the Khelo India program is a lack of awareness among the masses. Despite the program's efforts to promote sports and fitness at the grassroots level, many people are still not aware of the program's existence, which affects participation.

■ **Infrastructure challenges:** Another challenge faced by the Khelo India program is infrastructure challenges. Despite the program's efforts to create world-class sports infrastructure in the country, many areas still lack the necessary infrastructure, including training facilities, stadiums, and sports complexes.

■ **Shortage of trained coaches:** The program's success is also dependent on the availability of trained coaches who can provide high-quality coaching and training to athletes at the grassroots level. However, there is a shortage of trained coaches, which affects the program's effectiveness.

■ **Funding issues:** The program's effectiveness is also dependent on funding. Despite the government's efforts to provide financial assistance to promising athletes, more funding is needed to create world-class sports infrastructure and to support athletes in their training and development.

■ **Lack of support for indigenous games:** Although the program aims to promote indigenous games, there is still a lack of support and infrastructure for these games, which affects their popularity and development.

■ **Gender bias and lack of opportunities:** Despite the program's efforts to promote the participation of girls in sports, there is still a gender bias in many areas, and girls often face a lack of opportunities and support, affecting their ability to participate and excel in sports.

## Other initiatives

The Ministry of Youth Affairs & Sports has formulated the following schemes to promote sports in the country, including in rural, tribal and backward areas:

■ Assistance to National Sports Federations
■ Special Awards to Winners in International sports events and their Coaches
■ National Sports Awards, Pension to Meritorious Sports Persons

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- Pandit Deendayal Upadhyay National Sports Welfare Fund
- National Sports Development Fund; and
- Running Sports Training Centres through Sports Authority of India

## Benefits of Augmenting Sports

- **Alternative career development:** For those for whom opportunities are few, and jobs are scarce, sport becomes a powerful mobility device. A strong sports sector encourages an average/ poor academic student to make a career in sports.
- **Reaping demographic dividend:** India is having a very young population and is soon going to become the world's youngest country. In such a scenario, a robust sports sector can help in reaping the potential demographic dividend.
- **Revenue generation**: Developing robust sports infrastructure in the country will allow India to host a greater number of international events. Such hosting boosts tourism in the country and results in enhancing the revenue and employment in the region. Ex. IPL
- **Promotes the spirit of Unity in Diversity**: People cheer for the Indian athletes and Indian teams at international events. An improvement in sports automatically fosters the spirit of brotherhood amongst the people of diverse nations. For instance, the Pan India support enjoyed by Indian cricket team enhances belongingness between India's north and south.

## Looking ahead

- **Increasing awareness and outreach:** The government can increase awareness and outreach efforts to promote the program and encourage more people to participate in sports and fitness activities.
- **Promoting indigenous games:** The government can promote indigenous games by providing the necessary infrastructure, support, and funding for these games to increase their popularity and development.
- **Ensuring gender equality:** The government can ensure gender equality by promoting the participation of girls in sports and providing equal opportunities and support for both male and female athletes.
- **Collaboration with private sector:** The government can collaborate with the private sector to increase funding and support for sports and fitness activities.
- **Uniformity in sports activities:** Sports being a state subject, uniformity in sports activities across various states in India is essential to provide equal sporting opportunities to all citizens of the country.
- **Collective action for talent development:** To develop a talent pipeline, it is necessary to take collective action to create a system and environment where young talent is spotted and nurtured.
- **Integration of sports with education:** To introduce a sports culture in India, there is a need to integrate sports with education, making it a mandatory part of the curriculum.
- **Increase allocation of funds:** The allocation of funds to sports, as a percentage of the budget, can be increased to broad-base sports in the country and provide adequate funding for sports development.

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- **Spreading awareness in society:** There is also a need to develop a sports culture in the whole country by spreading awareness in society and educating people about the benefits of sports in life.

## SC backs TN position on Jallikattu

- A *five-judge Constitution Bench of the Supreme Court* has upheld the amendments made by *Tamil Nadu*, *Maharashtra*, and *Karnataka* to *The Prevention of Cruelty to Animals (PCA) Act, 1960*, allowing *Jallikattu*, *Kambala*, and *bullock-cart races*.
- The court *overturned the verdict* of a two-judge Bench in '*Welfare Board of India v. A. Nagaraja' (2014)*, which had banned practices such as *Jallikattu*, the *traditional bull-taming sport of the Pongal harvest festival*.
- The five-judge Bench noted that *Jallikattu has been held in Tamil Nadu* for at least a century, and "we will not disrupt the view of the legislature that it is *part of the cultural heritage of the state*".
- In the 2014 '*Nagaraja' judgment*, an SC Bench of Justices K S Radhakrishnan and Pinaki Chandra Ghose had ruled that the *Prevention of Cruelty to Animals Act, 1960* "*over-shadows or overrides the so-called tradition and culture*".
- In its judgment delivered on 18 May 2023, the Constitution Bench said, "We do not accept the view of Nagaraja that **Jallikattu is not a part of cultural heritage of the State of Tamil Nadu.** We do not think that there was sufficient material for the Court to come to that conclusion."

**Pongal and the culture of Jallikattu**
- *Pongal* in *Tamil Nadu* is a *celebration of nature*, and thanksgiving for a bountiful harvest. Similar harvest festivals of *Makara Sankranti*, **Maghi**, and **Magh Bihu** are observed in other parts of the country at the same time, in mid-January.
- In Tamil Nadu, the **festival lasts for three or four days**, and on the third day, Mattu Pongal, **cattle are worshipped**. The **bull-taming events then start**, especially in the southern districts of the state, when the elite **Jallikattu breeds test** the strength and skill of farm hands in especially constructed arenas.
- Contests in *Avaniapuram*, *Peelamedu and Alanganallur*, villages neighbouring Madurai, set the tone for the season, which continues until April.

**Supreme Court's 2014 verdict**
- The **two-judge Bench** backed a perspective that *puts animal rights on a par with the fundamental rights* that the Constitution of India guarantees to its citizens. Drawing upon *Upanishadic wisdom*, the Bench had advised Parliament to "*elevate rights of animals to that of constitutional rights*, as done by many of the countries…, so as to protect their dignity and honour".
- *Jallikattu is doubtless a violent sport*, in which there is **only one winner** — **man or bull.** The **Animal Welfare Board of India**, a statutory body under the central government, and animal rights groups like **People for the Ethical**

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**Treatment of Animals (PETA)** presented evidence, including pictures and videos, that the **Jallikattu animals were physically and mentally tortured.**

- "**Bulls are beaten**, **poked**, **prodded, harassed** and **jumped** on by numerous people. They have their tails bitten and twisted and their eyes and noses filled with irritating chemicals," the judgment said.

**Case for culture and tradition**

- Even though the **case for Jallikattu as culture and tradition failed to impress the Bench in 'Nagaraja'**, it is not that there exists no tangible evidence to show that this battle between man and beast is indeed a cultural representation.

- Indeed, **Jallikattu has been celebrated in Tamil cinema** as an integral part of agrarian life. Novelists, including the late DMK leader M Karunanidhi, have woven plots around Jallikattu. Then, there is the **aspect of political economy**, of which **Jallikattu is the cultural manifestation.**

- **Jallikattu** is about showcasing the **quality of cattle**, the breeding skills of cattle rearers, the centrality of cattle in an agrarian economy, and the power and pride they bring to farmers and land-owning castes in rural Tamil Nadu. As a tradition, **it links an agrarian people** to the elemental aspect of their vocation; where a man risks his life to tame unpredictable nature. The bull, like land, is both his friend and foe. When the beast is bested, it brings bounty; defeat most likely means death.

- In the **Jallikattu heartland of Madurai** and its neighbourhood, life is hard. **Agriculture is a way of life**, but the **land is perennially short of water.** Heat and thirst are debilitating in the flatlands that spread from the foothills of the Western Ghats across the Vaigai basin to the lands bordering the fertile plains of the Cauvery in the east.

- This is the landscape that in the **ancient past hosted the Tamil Sangams**, but in recent times agriculture has become a difficult occupation. **Jallikattu here is almost a cathartic experience** — overcoming the violence of a harsh land where resources are scarce and life needs to be tackled with skill and cunning.

**Example in Tamil literature**

- Perhaps the best guide to the cultural universe of Jallikattu is **C S Chellappa's brilliant novella**, **'Vaadivasal' (Arena)**, a slim volume written in the 1940s, with a handful of male characters and bulls.

- **Picchi**, a young man from **Usilanoor village**, comes to the Periyapetti arena to tame the **Vaadipuram bull, Kari**, that had taken **his father's life in a previous Jallikattu.** Picchi is not after winning pride and prize; he is at the arena to settle what resembles a blood feud.

- An old man tells **Picchi:** "For **warrior castes like ours**, staying alive is never the primary goal. For us shedding blood is just like spilling water… Pounce on the bull after thinking it through. **If your first hold falters and slips, all will be lost**."

- **The pride of the bull-tamer is the primordial character of the warrior**, willing to die but unwilling to accept defeat. **Picchi tames the bull** and avenges his father. He tells the zamindar whose prized bull he defeated that he did not mean to disrespect him; he was doing only what a son ought to do. The zamindar admires the bull-tamer's skills and courage, but shoots the bull that had let him down.

- In his introduction to **N Kalyan Raman's beautiful English translation of Vaadivasal**, P A Krishnan says, "In deft sentences full of rural idioms and in a dialect that is special to Madurai and Ramanathapuram of the Tamil country, he (Chellappa) tells us all about **hierarchy, love, intimacy, pride, friendship, revenge** and, above all, the man-beast duel."
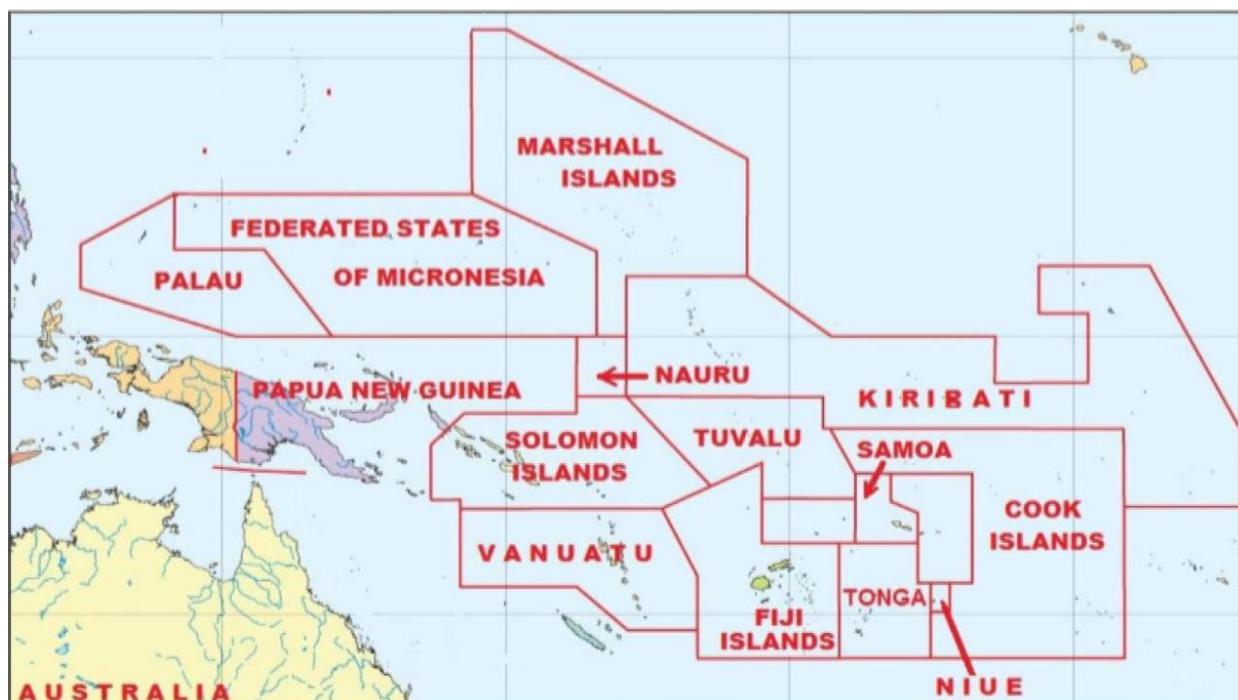
**The inescapable cultural context**

- 'Vaadivasal' is in a **social space** where **pride is a culture and tradition in itself.** It gives clues to **why the ban on Jallikattu was so fiercely contested.**
- For agrarian communities like **Thevars and Maravars**, **Jallikattu is one of the few markers of their social standing** and identity in a fast-changing world. The contest, which evidently celebrates **masculinity,** is almost an act of cultural resistance to an urban modernity that tends to marginalise rural and agrarian values.
- **Jallikattu's linkages with Pongal** has lifted it above its regional and community origins and transformed it into a symbol of Tamil culture and pride. **Pride in Tamil culture is central to Dravidian nationalism**, which continues to shape the political discourse in Tamil Nadu. Indeed, **the political consensus in favour of Jallikattu is inescapable.**
- **Tradition and culture are not immune to change.** But it is facile to argue that the rights discourse can be conducted ignoring the cultural context. The argument to move from an **anthropocentric vision** and **adopt a biocentric ethics** will have to be discussed and negotiated in cultural terms as well.
- In the absence of such engagement, **the supporters of animals rights** are likely to be seen as a **deracinated group** that is **insensitive to local culture and tradition.**

## The FIPIC summit

*Small Island nations of the Pacific Oceans* are in fact "*large ocean states*", said the Prime Minister, highlighting the *importance of the 14 members* of the *Forum for India Pacific Islands Cooperation (FIPIC)*. Addressing the opening session of the *FIPIC-3 summit in Port Moresby*, Papua New Guinea, PM spoke in favour of a *free and open Indo-Pacific region*. This visit was the *first by any Indian prime minister*, for the *Forum for India-Pacific Islands Cooperation (FIPIC) summit, 2023*.

- The *Forum for India–Pacific Islands Cooperation (FIPIC)* was launched during PM Modi's *visit to Fiji* in November 2014.
- *FIPIC includes 14 island countries* – Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu – that are *located in the Pacific Ocean*, to the *northeast of Australia*.

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## Idea behind FIPIC

■ According to the grouping's website, despite ***their relatively small size*** and ***considerable distance from India***, many of these islands have ***large exclusive economic zones (EEZs)***. ***EEZs is the distance up to which a coastal nation has jurisdiction over the ocean***, including ***both living and non-living resources***. It generally ***goes to 200 nautical miles*** or 230 miles (around 370 km) beyond a nation's territorial sea.

■ ***India's larger focus is on the Indian Ocean*** where it has sought to ***play a major role*** and ***protect its strategic and commercial interests***. The ***FIPIC initiative*** then marks a serious effort ***to expand India's engagement*** in the Pacific region as well.

■ Based on 2021-22 data, the ***total annual trade between India and Pacific Island countries is valued at $570 million***, in commodities such as ***plastics***, ***pharmaceuticals***, ***sugar***, ***mineral fuel*** and ***ores***. Among them, ***Papua New Guinea is the biggest trade partner*** in ***terms of value***.

## FIPIC summit

■ **This was the third FIPIC summit to be held.**

■ ***FIPIC-I***, ***in 2014***, took place ***at Suva, Fiji's capital city***. India announced various development assistance initiatives and other cooperation projects in areas of ***climate change, trade, economy, telemedicine and tele education***, IT, grants for community development projects, etc.

■ At ***FIPIC-II in 2015 in Jaipur***, India again ***announced similar initiatives***. India also approached the event from a ***large diplomatic perspective***, calling for a "***dedicated seat for Small Island Developing States in an expanded and reformed UN Security Council in both categories***".

■ "Our challenges are similar. ***Climate change is an existential threat to the Pacific Islands***. We both seek a concrete and effective outcome on climate

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change at the ***Conference of Parties-21 in Paris later this year***," the Prime Minister also said at the summit.

- ***In 2019***, the ***India-Pacific Small Island Developing States (PSIDS)*** Leaders' Meeting (comprising delegations of ***12 out of the 14 Pacific Islands countries***) was held on 24 September 2019 ***in New York*** on the sidelines of the 74th UN General Assembly.

- The ***Indian government*** then announced an ***allocation of $12 million grant*** ($1 million to each PSIDS) towards ***implementation of high-impact developmental projects in the area of their choice***. In addition, a concessional ***Line of Credit of $150 million***, which can be availed by the PSIDS for undertaking ***solar***, ***renewable energy*** and ***climate related projects*** based on each country's requirement, was announced.

## What happened at the FIPIC summit 2023?

- The ***third FIPIC summit was to be held in early 2020*** but was ***postponed because of the Covid-19 pandemic***. During his concluding remarks, the prime minister announced initiatives such as:

- \****Establishment of a super-specialty cardiology hospital in Fiji.*** "The Indian government will bear the full cost of this ***mega greenfield project***", the PM said.


## Against using artificial sweeteners

- The ***World Health Organisation***recommended ***against using artificial sweeteners to achieve weight loss*** and prevent lifestyle diseases such as  The report emphasised that while there was a ***need to cut intake of sugar***, it should not be ***replaced by artificial sweeteners.***

- ***Artificial sweeteners provide the sweet taste***with ***very little to no calories.*** Many diabetics use the sweeteners in their tea and coffee, but there is a growing market for packaged foods and beverages using these sweeteners ***to offer low-calorie options.***

- "WHO suggests that ***non-sugar sweeteners (NSS) not be used as a means of achieving weight control***or reducing the risk of ***non-communicable diseases***," was the highlight of 90-page report based on nearly 283 studies.

- There are currently six artificial sweeteners approved by the FDA:
    - Saccharin
    - Aspartame
    - Sucralose
    - Acesulfame potassium
    - Neotame
    - Advantame

## Health concerns

1. *Increased appetite*

Some research has suggested that artificial sweeteners may activate reward pathways in the brain that increase appetite. In fact, evidence suggests that, compared to

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consuming sugar or water, regularly consuming aspartame is linked with increased caloric intake, hunger, and sugar cravings.

2. *Weight gain*

Most people assume that artificial sweeteners will help with weight loss or weight management since they contain no calories. However, there is evidence linking long-term consumption of diet soda to increased body fat in older adults and higher BMI in children. Research is ongoing to better understand the correlation between artificial sweeteners and weight gain.

3. *Poorly regulated blood sugar*

While artificial sweeteners do not increase blood sugar levels, there is some evidence that they may increase insulin levels in the blood. Because of their sweet taste, the pancreas can mistake them for sugar. It's possible that there may be a link between long-term use of artificial sweeteners and insulin resistance (Type 2 diabetes). But more research is needed to better understand this relationship.

Consuming artificial sugars may also increase the frequency of reactive hypoglycemia (low blood sugar after eating). This is because these sweeteners cause an increase of insulin, which lowers blood sugar even though the body hasn't gotten any calories or energy from the sweetener. So even though artificial sweeteners don't raise blood sugar directly, they can still lead to poorly controlled blood sugar levels.

4. *Altered gut microbiome*

Bacteria in the gut react differently to artificial sweeteners than they do to real sugar. Saccharin and sucralose have been found to change the gut microbiome and have been linked to dysbiosis in humans. Dysbiosis is an imbalance of good and harmful bacteria in the gut and can lead to:

- Bloating
- Thinning of the barrier surrounding the intestines
- Migraines
- Autoimmune conditions
- Mood changes
- Irritability
- Anxiety

5. *Increased risk for stroke and heart disease*

A recent study done by the American Heart Association reported that frequently consuming artificially sweetened beverages in mid and late life was associated with a higher risk of stroke and other heart-related events. But more studies are needed to understand this relationship.

6. *Increased risk for metabolic syndrome*

Research has linked the intake of artificial sweeteners to the development of metabolic syndrome.

Metabolic syndrome is a term for a number of risk factors that raise your risk of major health problems such as heart disease, diabetes, and stroke. These risk factors include:

- Fat around the waistline
- High triglyceride levels
- Low HDL cholesterol
- High blood pressure

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- High blood sugar

**WHO recommendation on artificial sweeteners**

- While there could be **some weight-loss** and **reduction in Body Mass Index** in the short term as the **artificial sweeteners bring down the calories consumed**, but in the long run they have been **linked to weight gain**, the WHO report said. The sweeteners have also linked **to an increased risk of Type-2 diabetes**, **cardiovascular diseases**, and **mortality in the long run.** Some low certainty data also linked the use of such artificial sweeteners to **bladder cancer** and **preterm birth** when consumed by pregnant women.
- The **meta-analysis found** that **higher intake of NSS** was associated with a **23% increase in the risk of type-2 diabetes** when consumed in the form of beverages and 34% when added to foods. **Higher intake of these sweeteners** was also linked with 32% increase in **the risk of cardio-vascular disease** – including a 19% increase in risk for stroke – and **13% increase in the risk for hypertension.**
- It was also linked with a **25% increase in the risk for pre-term birth.** "Long-term adverse effects in the form of increased risk of death and disease offset any potential **short-term health** benefit resulting from the relatively small reduction in body weight and BMI observed in randomized controlled trials," the report said.
- The WHO has made these recommendations for everyone other than those who are already diabetic. "**Replacing free sugars with non-sugar sweeteners does not help** with weight control in the long term. People need to consider other ways to reduce free sugars intake, such as consuming food with **naturally occurring sugars like fruit**, or unsweetened food and beverages," says Francesco Branca, WHO Director for Nutrition and Food Safety, in a release.

**Is this the first-time artificial sweeteners have been linked to such adverse impacts?**

- The **analysis of WHO** is based on already existing studies, results for which have been pooled to reach the conclusions. In fact, the WHO said that it was a "**conditional recommendation**" because the evidence was of low certainty. However, the recommendations come on the heels of two important studies that have shown the long term consequences.
- A large French study that followed those taking **artificial sweeteners for nearly eight years** said that it increased the risk of cancers. Another large study published earlier this year showed that the artificial sweetener erythritol increased the risk of clotting and can lead to heart attacks or strokes.

**What do the doctors recommend?**

- Dr Anoop Misra, Chairman at **Fortis CDOC Hospital for Diabetes and Allied Sciences**, said that the **artificial sweeteners** should absolutely not be consumed by non-diabetics for weight loss. "Even among diabetics I would recommend it very selectively to those who have good control over their sugars. In fact, I would suggest that **they have ½ a tsp of sugar rather than the artificial sweeteners**," he said.
- He added: "If the sweeteners have been linked to **increased risk for cardio-vascular diseases or cancer**, the recommendation should also apply to

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diabetics as they are anyway at a higher risk of getting these diseases than the general population," he said.

■ Dr Ambrish Mithal, Chairman and Head, ***Endocrinology and Diabetes***, Max Healthcare, said that while ***the artificial sweeteners***were developed as a low-calorie alternate to sugar for those with diabetes, it is now being used by healthy individuals. "Because the ***calories from the artificial sweeteners is*** much lower than the calories from sugar, people have started substituting it for sugar as a possible tool to lose weight. This hasn't been proven in any study. In fact, studies suggest that they can lead to an increase the risk of insulin resistance and type-2 diabetes."

■ Here, Dr Misra makes a special mention of erythritol that can stay in the body for several days after being consumed. "It is usually mixed with other sweeteners to give them a more natural flavour, but it should not be consumed at all. Try and read the label to avoid it."

**Why are diet colas damaging?**

■ Dr Mithal explains that while the normal cola contains ***an extremely high amount of sugar***– around 12 spoons in 500 ml – ***diet colas promise zero calories.*** These zero calories is achieved by using ***artificial sweeteners.*** "People tend to drink it more because they think they are consuming fewer calories. But this can lead to long-term negative consequences, including insulin resistance and diabetes," he said.

■ He added artificial sweeteners are also intensely sweet, much more than sugar. So, it makes normal sweets taste less sweet and makes you crave for more sweets.

## Article 239AA - SC on "Power Distribution Between Delhi Government and Centre"

Recently, the **Supreme Court (SC)** has ruled in favor of the Delhi government on the issue of who controls the **Bureaucracy in the National Capital** where it ruled that the **Delhi government has legislative and executive powers over services** except for public order, police and land.

**Issue**

■ The issue in the case is whether the Government of **NCT (National Capital Territory)**of Delhi has legislative and executive powers in relation to "services" under **Schedule VII, List II, and Entry 41** of the Constitution of India and whether the **officers of the various "services" such as IAS, IPS, DANICS, and DANIPS,** who have been allocated to Delhi by the Union of India, come under the **administrative control of the Government of NCT of Delhi.**

■ The Issues of distribution of Power between Delhi government and Centre first arose from a reference made by a **two-judge Bench of the SC in 2019,**which left the question of **who will have control over the administrative services** for consideration by a larger Bench.

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■ The Delhi government challenged the constitutional validity of the **Government of National Capital Territory of Delhi (Amendment) Act 2021**, which provided that the term "government" referred to in any law made by the Legislative Assembly of Delhi will imply the Lieutenant Governor (L-G).

**SC Verdict**

■ Ruling in Delhi govt's favour, the SC held that the Lt. Governor **shall be bound by the decision of Delhi government over services,**apart from public order, police and land.

■ Disagreeing with the Centre which argued that the Constitution is a federal Constitution with a strong unitary bias as far as UTs are concerned, the **SC said, it is not unitary.**

- ■ "The**principles of democracy and federalism are essential features of our Constitution and form a part of the basic structure,**" it said.
  - ■ Federalism "is a means to reconcile the desire of commonality along with the desire for autonomy and accommodate diverse needs in a pluralistic society".
- ■ The SC stated that**Article 239AA establishes a legislative assembly** for NCT of Delhi. Members of the **legislative assembly are elected by the Delhi electorate.**
  - ■ If a democratically elected government is **not given the power to control the officers,**the principle of **triple chain of accountability will be redundant.**
  - ■ The principle of **collective responsibility extends to the responsibility of officers,**who in turn report to the ministers. If the officers stop reporting to the ministers or do not abide by their directions, the entire principle of collective responsibility is affected.
- ■ The Delhi government, much like other States,**represents the representative form of government** and any further expansion of the Union"s power will be **contrary to the Constitutional scheme.**

**Article 239AA of the Constitution**

■ Article 239 AA was inserted in the Constitution by**The Constitution (69th Amendment) Act, 1991** to give **Special Status to Delhi** following the recommendations of the S Balakrishnan Committee that was set up to look into demands for statehood for Delhi.

- ■ It says that the NCT of Delhi will have an **Administrator and a Legislative Assembly.**
- ■ Subject to the provisions of the Constitution, the Legislative Assembly "shall have power to make laws for the whole or any part of the NCT with respect to any of the **matters in the State List or Concurrent List**in so far as any such matter is applicable to Union territories" except on the subject of **police, public order, and land.**

■ Further, the Article 239AA also notes that **L-G has to either act on the aid and advice of the Council of Ministers,**or he is bound to implement the decision taken by the President on a reference being made by him.

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- Also, **Article 239AA, empowers the L-G to refer a difference of opinion** on 'any matter' with the Council of Ministers to the President.
- Thus, this dual control between L-G and the elected government leads to a power tussle.

## Administration of UTs

- Part VIII (Articles 239 to 241) of the Constitution deals with the Union Territories.
  - UTs in India are administered by the **President through an administrator appointed** by him/her. The administrator is not elected but rather a **representative of the President.**
    - In some UTs, such as Delhi and Puducherry, the administrator holds significant powers, including the ability to make laws and regulations for the UT.
    - In other UTs, such as Lakshadweep and Dadra and Nagar Haveli, the administrator''s powers are limited to providing advice to the elected government.
  - The judiciary in UTs is also governed by the Constitution and the laws made by the Parliament. However, in some **UTs, such as Delhi, the High Court has wider powers than** in other UTs, such as Lakshadweep.
- **Special Provisions for Delhi and Puducherry:**
  - The Union Territories of **Puducherry (in 1963), Delhi (in 1992) and Jammu and Kashmir in 2019** (yet to be constituted) are provided with **a legislative assembly and a Council of Ministers** headed by a Chief Minister.
    - The Legislative assembly of the UT of Puducherry may make laws with respect to matters **enumerated in List II or List III in the Seventh Schedule of the Constitution** in so far as these matters are applicable in relation to the Union Territory.
    - The legislative assembly of National Capital Territory of Delhi also has these powers with the exception that **Entries 1, 2 and 18 of the List II are not within the legislative competence** of the legislative assembly.

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**Kuki Ethnic Nationalism**

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The demand for a separate Kukiland dates back to the late 1980s, when the first and largest of the Kuki-Zomi insurgent groups, the Kuki National Organisation (KNO), came into being.

The demand has surfaced periodically ever since.

In 2012, it became increasingly clear that the demand for a separate Telangana state would be accepted. At that time, an organisation called the Kuki State Demand Committee (KSDC) announced a movement for Kukiland.

- **Demand**

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- The KSDC claimed 12,958 sq km, more than 60% of Manipur's 22,000 sq km area, for Kukis and Kukiland.
- The territory of Kukiland included:
    - the Sadar Hills (which surround the Imphal valley on three sides),
    - the Kuki-dominated Churachandpur district, Chandel, which has a mix of Kuki and Naga populations, and
    - parts of Naga-dominated Tamenglong and Ukhrul.
- Unlike the Naga demand for a separate country, Kukis are only seeking a separate state within the Indian Union.
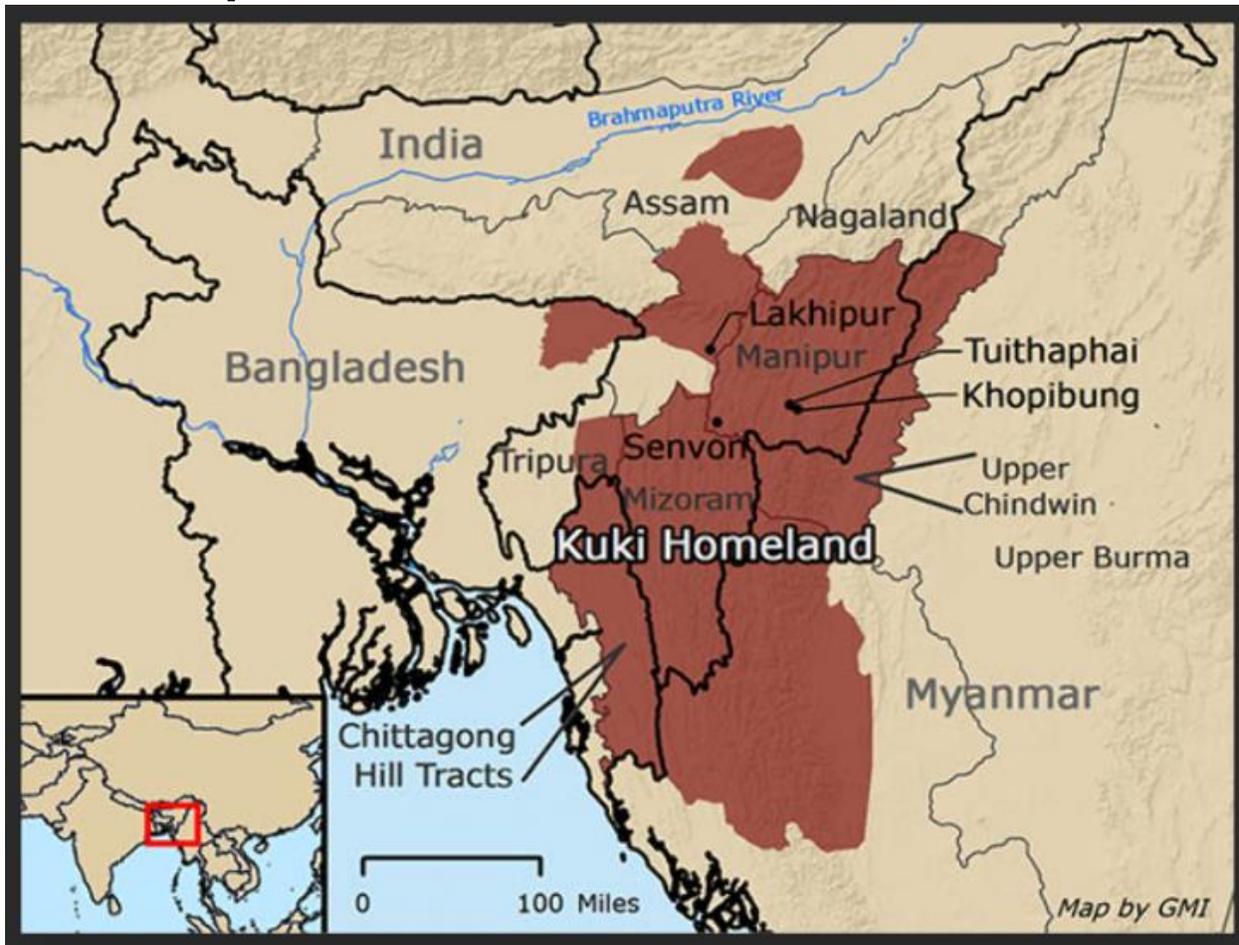


**Reasons behind the demand of Kukiland**

- **Historical**
    - The KSDC and sections of the Kuki-Zomi community have maintained that the tribal areas are yet to be a part of the Indian Union.
    - They have contended that after the defeat of the king of Manipur in the 1891 Anglo-Manipur war, the kingdom became a British protectorate.
    - However, the lands of the Kuki-Zomi were not part of the agreement.
- **The idea of the Zale'n-gam, or 'land of freedom'**

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- As per the Kuki-Zomi people, the Kuki Zale'n-gam sprawled across a large part of India's Northeast and contiguous areas in present day Myanmar.
- Under the Treaty of 1834, the British handed over a significant chunk of this land to Burma to appease the Ava or Burmese king.
- According to the KNO, the Zale'n-gam included the area up to the Chindwin River in Myanmar.
    - It covered the bordering regions of India, the areas around the Nantalit river in northern Myanmar, and stretched to the Chin state in the south.
- In India, the Kuki homeland included:
    - the hill districts of **Manipu**r, including the Naga areas, Kanjang, Akhen, Phek, and parts of Dimapur in **Nagaland**,
    - Karbi-Anglong, North Cachar Hills, and Halflong in **Assam**, and **Tripura**, as well as parts of the **Chittagong Hill Tracts in Bangladesh**.
- Over the years though, **this imagination of the homeland has shrunk to that of a state** created out of the hill areas of Manipur, including those dominated by the Naga tribes.

- **Identity and Cultural Preservation**
    - Manipur has a diverse ethnic population with Meitis controlling the Valley, Nagas on the surrounding hills and Kukis interspersed in between.
    - The Kuki community has a distinct cultural identity, language, and history.
        - The Kukis are Manipur's third major ethnic group, after the majority Meitei Hindus and the Naga tribes.
    - Hence, the community is demanding a separate state to preserve their identity and culture.
- **Clash with Naga group**
    - The community has alleged that Naga insurgent groups have been attempting to grab Kuki lands for decades.
    - During the Naga-Kuki clashes of 1993 more than 1,000 Kukis were killed, and many times that number were displaced.
- **Socio-economic development**
    - Some Kuki groups believe that a separate state would provide them with political power and control over their own resources which are largely controlled by the Meiteis.
    - This would allow them to achieve socio-economic development.
- **Administrative Autonomy**:
    - Kuki organizations argue that a separate state would enable them to make decisions on matters such as governance, law and order etc., based on their specific needs and aspirations.
- **Recent violence in Manipur**

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- Days after the tribal Kuki community clashed with the Meiteis on May 3, the demand for separate Kuki State has resurfaced.
    - A 'tribal solidarity march' was organised against the Manipur High Court's direction to the State to take steps towards granting ST status to the non-tribal Meitei community.
    - Violent clashes broke out at various places in Manipur during the course of this march.
    - At least 71 people were killed and thousands were displaced in the violence.
    - The clashes prompted the state government to issue shoot-at-sight orders, enforce a curfew and ban internet services.
- All the 10 Kuki MLAs (out of 60) in Manipur, including two state ministers, have raised the demand for a separate administration and separation from the state.
    - These MLAs alleged that the violence that started on May 3 was perpetrated by majority Meiteis.
    - It is tacitly supported by the existing government of Manipur.

## What is the electronic interlocking system in railways?

- Interlocking in railway signalling systems is a crucial safety mechanism used in the operation of train movements on railway tracks.
- It refers to a mechanism that controls the movement of trains to ensure trains move safely through a controlled area.
- The system is an arrangement of signals and points, which may be inter-connected mechanically or electrically or both.
- These arrangements operate in a manner so that a train can move from one track or junction to another safely, without coming in the way of another train.
    - The system is an alternative to the conventional Relay Interlocking system.
    - They are responsible for setting the signals, monitoring track circuits, and ensuring the safe movement of trains.
    - EI is an advanced signalling, computer-based system that uses electronic components to manage the movement of trains and the configuration of tracks.
    - The EI, which is based on software, is designed to prevent two trains from running on the same track at the same time.
    - It ensures that a train gets a go-ahead only when the route ahead is clear.
    - The interlocking system is usually operated and monitored by trained personnel from the signalling and telecommunications department in Railways, often known as 'signallers' or signal operators.
- **Three crucial elements of EI**

- Based on the status of the track ahead, signals are used to tell a train to stop (red light), proceed (green), or exercise caution (yellow).
- These are electrical circuits on tracks to detect the presence of a vehicle or a train on a section of track.
- Track circuits help to verify whether a particular route is clear or occupied and if it is safe for a train to proceed.
- A train can change its track using a point. These are movable sections of a track which guide the wheels towards either the straight or diverging track.
- Switch points are operated using switches to lead trains in the desired direction.
- For instance, if a train has to change lines, the switch point is activated ahead of time and the point is locked.
- A point machine is a device used for locking point switches and plays an important role in the safe running of trains.
- **Signal:**
- **Track circuit**:
- **Point switch**:
- **Functioning**
  - **Special circuits** ensure that another train cannot enter that section of track at the same time.
  - It acts like the black box of an aircraft and can store and process signal data to generate reports.
  - The EI signal system uses two factors to determine when a train can proceed: the direction of the track and whether the alternate track is clear.
  - First, the system checks if the train needs to continue on the current track or switch to a different one.
  - Then, it guides the train to an available track at a junction.
  - All activities in the signalling system are recorded in a microprocessor-based system called a data logger.
- **How does the system sense whether a track is occupied?**
  - They count how many sets of wheels or axles have passed over them in order to determine whether the entire train has passed through.
  - There are various kinds of track-occupancy sensing devices. Generally, sensors are installed on the tracks that detect the passage of wheels on the rails.
  - These are also called **axle counters.**
- **How safe is this system?**
  - If any of the three components (**signals, points, and track occupancy sensors**) does not correspond to the overall 'safe' logic fed into the computer, the system will work to stop the oncoming train.
  - It is called a **fail-safe system**, so it means that even if it fails, all the signals will turn red and all train operations will stop.
- **Status of implementation**

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■ As of 2022, 2,888 stations in India were equipped with an electronic interlocking system — comprising 45.5% of the Indian Railways network.

## All about Black Soil

- Black soils feed the global population and are under threat due to losing at least half of their soil organic carbon (SOC) stocks.
- Preserving natural vegetation on black soils such as grasslands, forests and wetlands and adopting sustainable soil management approaches on cropped black soils were the two main goals highlighted by the report.

**Black soil:**

- The inherent **fertility** of the soils makes them the **food basket** for many countries and are considered essential to the global food supply.
- These soils are characterised by a **thick, dark-coloured** soil horizon **rich in organic matter**.
- Black soils are **extremely fertile** and can produce high agricultural yields thanks to their elevated **moisture storage capacity**.
- Europe and Eurasia accounted for 70 per cent of the soil in the total cropland, while North America, Latin America and the Caribbean and Asia had 10 per cent each.

**Features of Black soil:**

- Clayey in texture
- Highly fertile
- High moisture retention
- Rich in calcium carbonate, magnesium, potash and lime
- Poor in nitrogen and phosphorous
- Contractable, develops deep wide cracks on drying

**Significance:**

**INDIA**
Major Soil Types

PAKISTAN
CHINA (Tibet)
NEPAL
BHUTAN
BANGLADESH
Bay of Bengal
Arabian Sea
Lakshadweep (India)

- Forest and Mountainous Soil
- Alluvial Soil
- Red & Yellow Soil
- Black Soil
- Laterite Soil
- Desert or Arid Soil
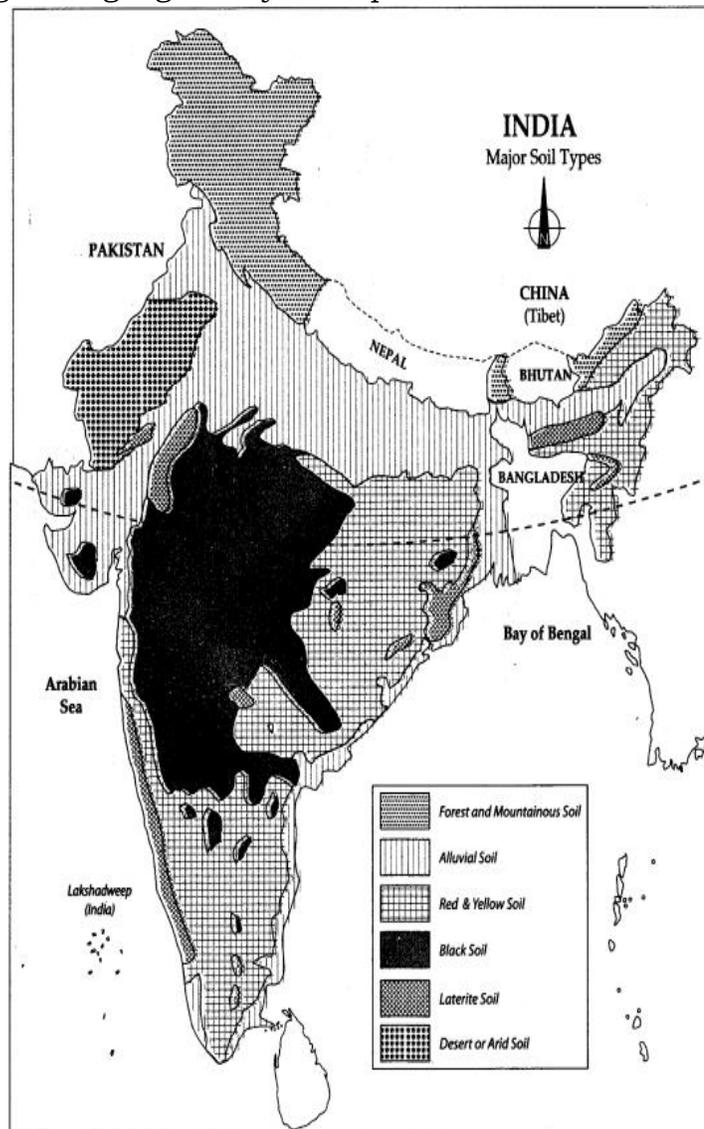
- They constitute **5.6 per cent** of global soils and contain **8.2 per cent** of the world's SOC stocks i.e. approx. 56 billion tonnes of carbon.
- Globally in 2010, 66 per cent of sunflower seeds, 51 per cent of small millet, 42 per cent of sugar beet, 30 per cent of wheat and 26 per cent of potatoes were harvested from black soils.
- The ability of the soils to remove carbon from the atmosphere and lock it up in soil organic matter (called **carbon sequestration**) has been proposed as an important solution to mitigate human-induced climate change.
- Black soils have the potential to provide **10 per cent** of the total SOC sequestration globally if they receive proper attention.
- Europe and Eurasia have the highest potential at over 65 per cent and Latin America and the Caribbean at around 10 per cent, according to **FAO's global Soil Organic Carbon Sequestration Potential map.**
- Black soils were home to **2.86 per cent of the global population** and had 17.36 percent of cropland, **8.05 per cent of global SOC** stock and **30.06 per cent SOC stock of global cropland**

**Threats:**

- Most of the black soils suffered from **moderate to severe erosion** processes, as well as **nutrient imbalances, acidification and biodiversity loss**
- Black soils have **lost 20 to 50 per cent** of their original **SOC** stock, with the carbon being released into the atmosphere mostly as carbon dioxide, exacerbating **global warming**
- Land-use change, unsustainable management practices and excessive use of agrochemicals are to blame

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## Mitigation Investigation in Death Penalty Cases in India

- Recently, the Supreme Court of India has initiated **a *suo motu* writ petition**(criminal) to frame guidelines on the **mitigation analysis** in the cases pertaining to **death penalty sentencing** or **capital punishment**.
- **Procedure for capital punishment -** If a sessions court (sentencing court) award a capital punishment, then it is to be confirmed by the**jurisdictional High Court** (confirming court) under Chapter 28 of the **Code of Criminal Procedure**.

**Evolution of the Jurisprudence related to death penalty in India**

- In *Bachan Singh vs State of Punjab* **(1980)**, the supreme court called for balancing the **mitigating**and **aggravating circumstances** against each other. The court laid down the principle that the **death penalty** ought not to be awarded unless the alternative of life imprisonment is "**unquestionably foreclosed**". It should be awarded only in a **rarest of rare case**.
- However, in later judgment, the **Supreme Court**has begun to inquire into **sentencing methodology** with great interest.
- In *Rajendra Pralhadrao Wasnik vs The State of Maharashtra* **(2018),**the Court directed to analyse the conduct of the convict in jail, outside jail if on bail for some time, medical evidence about his mental make-up, contact with his

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family and so on". The court directed to furnish reports related to these aspects. These reports are very important for the **mitigation investigation.**

■ In *Mofil Khan vs State of Jharkhand* (**2021**), the court held that the "the State must prove that the reformation and rehabilitation of the accused is not possible" and that "the Court will have to highlight **clear eviden**ce as to why the convict is not fit for any kind of **reformatory** and **rehabilitation scheme**."

■ In *Manoj & Ors vs State of Madhya Pradesh* (**2022**), the Court issued directions that all "report(s) of all the **probation officer(s)"** relating to the accused and reports "about their conduct and nature of the work done by them" while in prison should be placed before the court. In addition, a **trained psychiatrist** and a **local professor of psychology** should also conduct a **psychiatric** and **psychological evaluation** of the convict.

**Issues in award of the capital punishment**

■ According to a report by the **National Law University Delhi's Project 39A** titled '**Matters of Judgment**' there is **no judicial uniformity** or **consistency** in awarding of the death sentence. *Project 39A*, attached to the *National Law University, Delhi*, is a pioneering agency in the *area of mitigation investigation*" which deals with various aspects of death penalty laws, the amici suggested availing the services of the said expert agency for "*effective conduct of mitigation investigation*".

■ According to the Project 39A report titled '**Death Penalty Sentencing in Trial Courts'**, the courts have been lax in assessing the **aspect of reformation** while undertaking the **sentencing exercise.**

**Looking Forward**

■ There is a **new wave of thinking** in the domain of capital punishment. It was timely and necessary that the Supreme Court come up with the guidelines on the matter of **mitigation analysis**.

■ The court should explain what constitutes the **mitigating circumstances**, the role of a **probation officer** in assisting the Court and the **potential value addition** of a **mitigation investigator** to the sentencing exercise.

■ For a complete **mitigation investigation**, in addition to legal professionals, there is a requirement of **professionals** trained in **psychology**, **sociology** and **criminology**.

■ The SC's guidelines related to the **mitigation investigation** will strengthen **the doctrine of the rarest of rare**. This will ensure that the **sentencing** and **confirming courts** exercise their **capital punishment sentencing power** with greater fairness.

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### What is the 'landfall' of a cyclone?

■ Landfall is the event of a tropical cyclone coming onto land after being over water.

■ As per the IMD, a tropical cyclone is said to have made a landfall when the center of the storm – or its **eye** – moves over the coast.

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- ■ The "eye" of a cyclone is a region of relatively calm weather found at the center of the storm.
  - ■ It is a circular or oval-shaped area characterized by light winds, clear or partly cloudy skies, and decreased precipitation.
  - ■ The size of the eye can vary significantly, ranging from a few kilometers to over 50 kilometers (30 miles) in diameter in larger cyclones.
- ■ During landfall, the outer bands of the storm may have already reached the coast, bringing strong winds, heavy rain, and storm surge.
- ■ Landfall marks the moment when the cyclone officially reaches the land.
  - ■ A landfall should not be confused with a 'direct hit', which refers to a situation where the core of high winds (or eyewall) comes onshore but the centre of the storm may stay remain offshore.
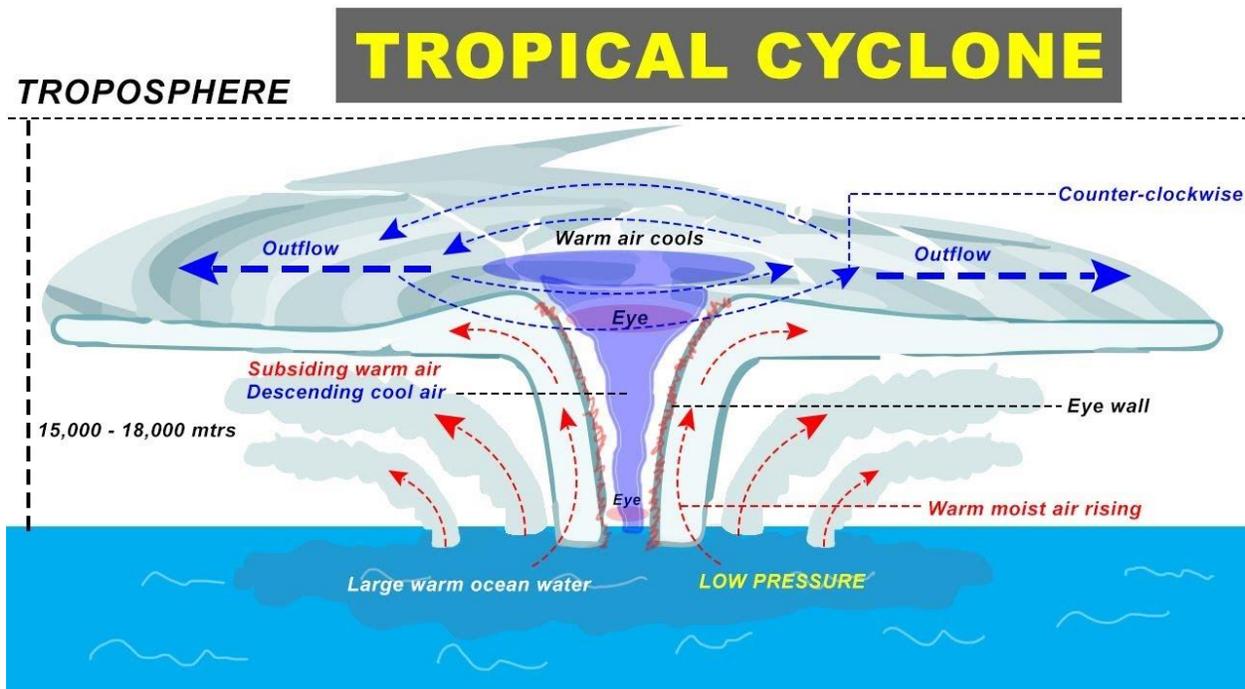


**Damage caused**
- ■ The damage caused by the landfall will depend on the **severity of the cyclone – marked by the speed of its winds**.
- ■ E.g., Cyclone Biparjoy, classified by the IMD as a "very severe cyclonic storm", the impact may include extensive damage to kutcha houses, partial disruption of power and communication lines, minor disruption of rail and road traffic, etc.

**Lasting time**
- ■ Landfalls can last for a few hours, with their exact duration depending on the speed of the winds and the size of the storm system.
  - ■ e.g., Cyclone Biparjoy's land process is expected to last around five to six hours, with the cyclone almost completely dissipating over approximately the next 24 hours.
- ■ **Cyclones lose their intensity once they move over land** because of sharp reduction of moisture supply and increase in surface friction.

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- This means that while landfalls are often the most devastating moments of cyclones, they also mark the beginning of its end.

## Management of cyclones

- The National Disaster Management Authority (NDMA) in India outlines several key components for the management of cyclones. These components include:
- **Risk Assessment and Early Warning Systems**
    - Conducting risk assessments to identify vulnerable areas, populations, and infrastructure.
    - Developing and maintaining robust early warning systems that provide timely and accurate information about approaching cyclones.
    - Disseminating warnings and advisories through multiple channels to reach the affected communities and stakeholders.
- **Preparedness and Planning**
    - Developing and regularly updating cyclone-specific disaster management plans at national, state, and local levels.
    - Identifying and establishing cyclone shelters, evacuation routes, and assembly points in vulnerable areas.
    - Stockpiling and pre-positioning essential emergency supplies such as food, water, medical provisions, and relief materials.
    - Conducting regular drills, exercises etc.
- **Mitigation measures**
    - **Strict adherence to building Codes and Regulations** in cyclone-prone areas
    - **Coastal Zone Management**:
        - Implementation of effective coastal zone management plans to regulate development activities along vulnerable coastlines.
        - It also includes Mangrove Plantation, development of bio-shields, shelter belt plantation, coastal flood management etc.
- **Infrastructure Development**:
    - Regular maintenance and strengthening of critical infrastructure such as roads, bridges, power lines, and communication networks.
- **Response and Coordination**
    - Activating emergency response mechanisms at all levels of governance, including the National, State, and District Disaster Management Authorities.
    - Coordinating with various stakeholders including NGOs
    - Mobilizing resources, including manpower, equipment, and relief supplies, for rescue, evacuation, medical assistance, and other response operations.
    - Establishing emergency operation centers and coordination cells to facilitate real-time information sharing and decision-making.
- **Evacuation and Shelter Management**
    - Ensuring the availability and readiness of cyclone shelters and evacuation centres, equipped with basic amenities and facilities.

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- Organizing systematic and orderly evacuations, prioritizing the safety and well-being of vulnerable groups such as the elderly, children, and people with disabilities.

- **Recovery and Rehabilitation**
    - Undertaking post-cyclone damage assessments to ascertain the extent of destruction and prioritize recovery efforts.
    - Providing immediate relief assistance to affected communities, including shelter, food, water, healthcare, and sanitation facilities.
    - Implementing medium- and long-term rehabilitation and reconstruction plans to restore infrastructure, livelihoods, and community resilience.
    - Promoting sustainable development practices and resilient infrastructure designs to minimize future vulnerability.

## Steps taken by India

- **National Cyclone Risk Mitigation Project (NCRMP)**:
    - Launched by the MHA, this project aims to reduce the vulnerability of coastal communities and infrastructure to cyclones and storm surges.
    - It focuses on capacity building, early warning systems, cyclone shelters, evacuation planning, and community awareness.
- **IMD's Colour Coding of Cyclones**
    - Four colours - Green, Yellow, Orange, and Red – are used by IMD to make people aware about the severity of cyclones.
- **Integrated Coastal Zone Management (ICZM) Project**
- **Coastal Regulation Zones (CRZ)**
- **Other general steps taken**:
    - National Disaster Response Force (NDRF)
    - National Disaster Management Plan (NDMP)
    - National Institute of Disaster Management (NIDM)
    - State Disaster Management Authorities (SDMAs)

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## Focus on Agricultural Value Chain

- Agriculture has become a point of focus in the past few years in the **context of climate change.**
- This focus is not misplaced, as agricultural activities are responsible for **19-29 per cent** of global greenhouse gas (GHG) emissions and **14 per cent** of India's total GHG emissions.
- To sustainably develop our food system, the scientific community, policymakers and civil society have dedicated most attention to the production of food.
- They suggested various interventions like the **development of new hybrid varieties, the introduction of water-efficient irrigation systems and switching away from chemical inputs.**

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- But it is time to start focusing on the whole **agricultural value chain** rather than just the production to tackle the **three-fold challenges of rural livelihoods, adaptation and mitigation.**

**Reasons to focus on Agricultural Value Chain**

- The environmental impacts of these **value chains" post-production**.
- The need to develop efficient supply chains where the sustainably produced agricultural output can compete with established value chains of their unsustainable counterparts.
- This approach will distribute the **burden of the sustainability transition** from the farmer to other actors along the supply chains.

**Environmental Impact of Agricultural Value Chains**

- Different steps exist between commodity production and reaching the end consumer:
    - Value addition and packaging
    - Procurement
    - Distribution via land, air, and sea
    - International trade
    - Consumption patterns
    - Storage at various stages
    - Wastage during the life cycle
- Certain commodities like **sugar and rubber** undergo large-scale processing, which can contribute to environmental issues such as **water pollution and high energy consumption.**
- The environmental impacts of these steps can significantly affect a **commodity"s overall footprint.**
- **Example: Cotton** serves as an example, as energy use and emissions from farming represent only a small portion of the total energy use and emissions throughout the cotton yarn value chain
- The horticulture sector in India is a major **producer, consumer, and exporter of commodities** like **bananas, cashews, and onions.**
    - Due to their **perishable nature**, **cold storage** is essential during transportation.
- India"s current cold storage capacity covers **only 6.7% of its total produce**, which should increase to **approximately 20%** to meet growing production demands (as mentioned in a 2016 study).
- The existing cold-storage capacity accounts **for 1.2 gigawatts** (0.5% of total electrical capacity).
    - It may rise **to 7.8 gigawatts by 2030.**
- The approach to meeting this **increased demand** for electrical energy will determine the associated emissions from the cold chain.

**Value chains for sustainably produced commodities**

- There has been a renewed emphasis on **organic farming** over the past decade, with various approaches such as-
    - **Zero-budget natural farming,**
    - **Agroecology,**

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- - **Organic agriculture, and**
  - **Regenerative agriculture.**
- These approaches advocate moving away from **chemical-intensive monoculture** towards a more **nature-friendly production system**. It involves-
  - **Biological inputs,**
  - **Mmulti-cropping, and**
  - **Seed conservation.**
- Policymakers are increasingly interested in the positive impacts of these alternative approaches on **soil health, water management, and biodiversity.**
  - **Andhra Pradesh, Himachal Pradesh, Meghalaya, and Sikkim** are leading the way by implementing **state-specific policies**.
  - They are securing funding to train farmers in **nature-friendly techniques and expand organic agriculture.**
- Government of India has launched the **National Mission on Natural Farming** to support these practices at a national level.
  - However, a significant challenge lies in **marketing and distribution**, as sustainably farmed produce must compete with **conventionally farmed produce** that has well-established supply chains.

**Challenges**
- The demand side challenge is to **identify markets** where price-conscious Indian consumers are willing to pay a premium for eco-friendly produce and trust its authenticity.
- Farmers need access to established **chains and processes** that protect them during the transition to sustainable farming.
- **Using Reliable sourcing, distribution, and marketing channels** is necessary for all stakeholders, along with **eco-certification initiatives that** can create **new demand and markets.**
  - It may also reduce prices to be comparable with **conventionally farmed produce**.
- Traditional distribution channels may not always be suitable for **naturally farmed produce**.
  - Naturally farmed produce requires separate **handling, higher prices, and reaching niche markets.**
- During the COVID-19 pandemic, **several basket models and farm-to-plate start-ups** emerged in urban areas, but their reach was limited to affluent consumers.

**Need for Transition in Agriculture**
- Farm-focused efforts often place an excessive **burden on farmers** on particularly small and marginal farmers because they lack the **resources and agency** to bring about significant changes in their practices.
- Achieving a just transition in agriculture requires **distributing the burden of action equitably** across the entire value chain, considering the shared environmental impacts while **safeguarding rural livelihoods and farm incomes.**

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- Both **small and large agri-businesses** are implementing sustainability initiatives, such as **waste reduction, recycled packaging, quality planting material, research for new varieties, and efficient technologies**.
- These initiatives showcase the willingness with greater **resources and agency** to take responsibility and drive change in the industry.
- However, agri-businesses need to further **invest in building the capacity of farmers, providing safety nets**, and offering **extension services** to ensure a more comprehensive approach.

**Reasons to focus on Agricultural Value Chain:**

- The environmental impacts of these **value chains'' post-production**.
- The need to develop efficient supply chains where the sustainably produced agricultural output can compete with established value chains of their unsustainable counterparts.
- This approach will distribute the **burden of the sustainability transition** from the farmer to other actors along the supply chains.

**Sustainable Practices in the Private Sector**

- International climate commitments have prompted many businesses to voluntarily establish **sustainability targets.**
- Several influential companies in specific commodity sectors have the potential to drive significant change and contribute to the **transition towards sustainability.**
- These companies can facilitate two crucial transitions:
    - **Micro-level transition:** Supporting farmers in adopting sustainable practices on their farms.
    - **Supply chain-level transition:** Transforming procurement, processing, packaging, and transportation methods for agricultural products.
- By actively engaging in these transitions, these key players can contribute to a more sustainable and environmentally friendly agriculture sector.

Conceptualising sustainability in the agricultural commodity sector by making the value chain the unit of analysis and intervention can take long in meeting the challenges that agricultural production must address that is mitigating environmental footprints, adapting to a changing climate while delivering economic benefits to the farmers and other actors in the value chain. This can facilitate the adoption of new environment-friendly technologies and practices and the capacity building of farmers.

## Protecting Intellectual Property in India

In 2000, the **World Intellectual Property Organization's (WIPO) designated 26th** April – the day on which the WIPO Convention came into force in 1970 – **as World Intellectual Property Day**, with the aim of increasing general awareness and understanding of IP.

- The**theme of World Intellectual Property 2023, is "Women and IP: Accelerating Innovation and Creativity".**

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**Note:** According to **WIPO data released in March 2023,** it is estimated that in 2022 **only 16.2% of inventors named in international patent applications** were women. While **numbers are rising, progress is slow.**

**Intellectual Property**

- **Intellectual property**is the **most valuable asset in the modern age,** rewarding as it does the technological innovation that drives human progress. It also helps the global art scene to flourish.
- Essentially **Intellectual property refers to the creations of the mind.**That includes inventions of all kinds, literary and scientific, artistic works, designs and many other things.
  - They can also refer to individuals whose reputation itself commands commercial advantage and profit.
- **IP Rights:**
  - The WIPO sets down the rules to confer certain exclusive rights to the inventors or creators of that property so that they **can reap commercial benefits from their creative efforts or reputation.**
  - It is a**form of legal protection in the form of Intellectual Property Rights (IPR) given to individuals** or companies for their creative and innovative works.
    - These rights are outlined in **Article 27 of the Universal Declaration of Human Rights.**
  - These legal protections **allow the creators to control the use of their work and prevent others from using**or reproducing them without permission.
- **Types:**
  - The **main types of IP include patents**for inventions, **trademarks** for branding, **copyrights** for artistic and literary works, trade secrets for confidential business information, and industrial designs for product appearance.
- **India and IPR:**
  - India is a **member of the World Trade Organisation**and **committed to the Agreement on Trade Related Aspects of Intellectual Property (TRIPS Agreement).**
  - India is also a **member of WIPO, a body responsible for the promotion of the protection of intellectual property rights throughout the world.**
  - The**National Intellectual Property Rights (IPR) Policy 2016 was adopted in May 2016** as a vision document to guide the future development of IPRs in the country.
    - Its clarion call is**"Creative India; Innovative India".**

**Patent Criteria in India**

- A Patent is a **statutory right for an invention granted for a limited period of time to the patentee by the Government,**in exchange of full disclosure of his invention for **excluding others, from making, using, selling, or importing the patented product** or process for producing that product for those purposes without his consent.

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- **Term:**
  - The**term of every patent granted is 20 years from the date of filing of the application.**
    - However, for applications filed under the national**phase under Patent Cooperation Treaty (PCT),** the term of the patent will be 20 years from the international filing date accorded under PCT.

## Role and Importance of a Strong IPR Ecosystem

- **Incentivizing Innovation:**A strong IPR ecosystem provides legal protection and rewards for creators" innovations. This incentivizes individuals and businesses to invest in research and development, fostering a culture of continuous innovation. As a result, the nation can advance technologically and economically.
- **Collaboration and Knowledge Sharing:**The collaboration of different creatives brings their knowledge and skills together. A robust IPR system encourages collaboration by ensuring that the intellectual property of each participant is protected.
  - Thi**s leads to knowledge sharing, technology transfer, and cooperation among industries**and institutions, contributing to overall progress.
- **Government Support and Legal Platform:**The government plays a crucial role by providing a legal platform and enacting laws that protect intellectual property rights.
  - This support**creates an environment of certainty and security for creators and innovators,** enabling them to focus on their work without the fear of unauthorized use or infringement.
- **Responsible Use and Benefit Sharing:**It ensures responsible use of intellectual property rights and fair benefit sharing between creators and society. A robust IPR ecosystem ensures that creators use their intellectual property rights responsibly, balancing their rights with the interests of society.
  - It also **ensures that the benefits derived from innovations are shared equitably**, fostering a sense of fairness and societal progress.
- **Economic Growth and Competitiveness**: A strong IPR ecosystem attracts investments and promotes economic growth. It encourages businesses to develop and protect their intellectual assets, enhancing their competitiveness in domestic and international markets. This leads to job creation, increased exports, and overall economic advancement.
- **International Relations and Trade:**Nations with a robust IPR system are more likely to have favourable trade relations. Compliance with international standards of intellectual property protection enhances a nation"s reputation, facilitating trade negotiations, and promoting the export of innovative products and services.
- **Public Health and Safety:**Strong IPR protection in areas like **pharmaceuticals** ensures that innovators and manufacturers are incentivized to develop new medicines and technologies. This contributes to **public health and safety** by promoting the creation and availability of life-saving treatments and products.

## India's Current Scenario

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- **Initiatives:**
    - India has **made significant changes to its IPR laws since 1999**, and with recent implementations like the **National IPR Policy**, **National (IP) Awareness Mission (NIPAM)**, **Kalam Program for Intellectual Property Literacy and Awareness Campaign (KAPILA)**, and as a result of certain procedural simplifications,**has further strengthened the IP regime.**
- **Rank in Global Innovation Index (GII):**
    - India was**ranked 40th position out of 132 in the Global Innovation Index (GII) 2022 rankings** released by WIPO.
        - India was **ranked 46thposition in 2021, and 81st rank in 2015.**
    - **Other Related Visions:**
        - India is **rapidly progressing towards becoming Asia"s Innovation Hub**and aspires to **become a global manufacturing hub.**
            - The Prime Minister has**set a deadline for India to become a developed nation by 2047.**

## Women"s Participation

- **Education and Awareness:**Promote **STEM (Science, Technology, Engineering, and Mathematics)** education for girls and women from an early age. Encourage their participation in relevant academic programs, workshops, and training sessions to enhance their knowledge and skills in innovation and IP.
- **Mentorship and Role Models:**Establish mentorship programs that connect women innovators with experienced professionals in their field. Encourage successful women innovators to serve as role models and inspire aspiring innovators to pursue their ideas and protect their IP.
- **Networking and Collaboration:**Facilitate networking opportunities and platforms where women innovators can connect, collaborate, and share their experiences. Establish communities, forums, and support networks specifically focused on women in innovation and IP.
- **Funding and Resources:**Provide access to funding opportunities, grants, and resources that specifically target women innovators. Create initiatives and investment funds dedicated to supporting women-led startups and innovations.
- **IP Training and Support:**Offer specialized training programs and workshops on IP rights, including patents, trademarks, and copyrights, specifically tailored for women innovators.
    - Provide guidance and support in navigating the IP system, including assistance with filing applications and understanding licensing options.
- **Cultural Shift and Stereotype Breakdown**: Challenge societal stereotypes and biases that hinder women"s participation in innovation and IP. Promote inclusivity, diversity, and equal opportunities in all aspects of the innovation ecosystem.

Traditional approaches may no longer be effective or efficient in tackling the challenges which are in the way, especially considering the large population size of a country like India. Out-of-the-box thinking and technology interventions are seen as crucial in finding rapid and scalable solutions.

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MOOCs Platforms

- A new category of online courses known as **"Massive Open Online Courses"** **(MOOCs)** emerged as the world recovered from its economic downturn in 2011.
    - It is propelled by **reputable educational institutions**.
- Despite the fact that MOOCs have existed **since 2008**, their institutional roots can be found in **three free online courses** Stanford University provided **in 2011.**

**Udacity, Coursera, and edX**

- Thrun launched his online education company, **"Udacity,"** as a for-profit business in late 2011.
- Andrew Ng and Daphne Koller"s business, **"Coursera,"** which was also registered as a **"for-profit" company**, followed suit a year later.
- MIT and Harvard collaborated to found **"edX" in May 2012** as a **non-profit MOOCS company**.
- The innovative founder of edX is widely credited with **opening-sourcing and globalising** the business"s "open edX tech stack."
- All three groups were successful in developing MOOCS on a **worldwide scale** with the **assistance of the best universities and institutions** on the planet.

**MOOCs platforms in India**

- The **Indian Institute of Technology (IIT) Bombay and the IIT Bangalore** were among the **first mover in India.**
    - Both organisations use the **edX platform** to provide a **range of MOOCS courses**.
- Nearly **35 MOOCs Learning Management Systems (LMS)** were in use as of 2021, with locations in **North America, Asia, and Europe.**
- **"Study Webs of Active-Learning for Young Aspiring Minds" (SWAYAM)** is one of the largest learning e-portals in the world.
    - It was launched in 2017 by the Ministry of Education, Government of India.
    - It is included on the list of significant LMS platforms from the developing world.
- There were 220 million MOOCS students worldwide (excluding China) in 2021, according to "Class Central."
    - 97 million students were enrolled in Coursera.
    - 42 million and 22 million students were enrolled in **edX and SWAYAM in India.**

**Challenges Faced by MOOCs Platforms**

- Although MOOCS platforms appear to have a **large number of students** enrolled, their financial situation is fragile.
- A MOOCS platform"s operating **costs are high** because of the LMS tech stack"s maintenance costs and high marketing costs.
    - Both are incurred to **increase the learner base**.

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- ■ The practice of providing **introductory courses for free** (or at low costs) made these platforms'' **financial struggles worse**.
- ■ Although most MOOCS platforms rely on degree-granting courses to generate income, these courses have a **low enrollment rate**.

*Role of Generative AI in MOOCs Platforms*
- ■ These factors may help to explain why regenerative AI is being used by **Coursera, edX, and Khan Academy.**
- ■ With the aid of the Chat GPT plug-in from edX, prospective students can easily find platforms and programmes that meet their needs.
- ■ While edX''s **"edX Xpert"** and Coursera''s **"AI Coursera Coach"** serve as virtual assistants that answer questions, give feedback on assignments, produce quick summaries of dense content, and quickly produce exam results.
- ■ Khan Academy''s chat box ''Khanmigo'' challenges students with thought-provoking questions.
- ■ Dropout rates will inevitably **decline as learning becomes more interesting and engaging**,
- ■ It will result in more students **advancing to degree-granting programmes**.

**In India**
- ■ SWAYAM from India has not yet made clear **how it will handle AI.**
  - ■ However, it is in for some **interesting times**.
- ■ When there are 900 million active Internet users in India by 2025. the SWAYAM user base will have **significantly increased**.
- ■ Institutes connected to the platform will need to use **AI-based learning and teaching services** due to the rapid scale up.
- ■ SWAYAM is **publicly funded** and it is based on the **principles of inclusivity and cross-disciplinary learning**.
- ■ SWAYAM courses will move towards cross-disciplinary course offerings that **make use of unstructured data** in the coming years.
- ■ Thus, SWAYAM is ideally positioned to derive benefits from the **evolving semantic web.**

Only time will tell if regenerative AI tools will actually support the financial success of online education platforms. What is certain at this time is that major international online education brands will not hesitate to experiment with regenerative AI tools.

## A disability-inclusive city

- ■ Persons with disabilities face many challenges in participating fully in urban life.
- ■ Inclusive infrastructure is needed to allow them the same opportunities to enjoy **cultural, economic, and social life** as non-disabled persons.
- ■ These opportunities include **freedom to move independently** and **access places of work, education and sports.**

*Need for Inclusive Cities*
- ■ Two mega-trends make the need for inclusive cities increasingly urgent.

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- **Rapid Urbanisation:** India is **urbanising rapidly**. It is projected to add **four new megacities by 2030.**
  - The country's urban population is estimated to **cross 675 million.**
  - **One in three persons with disabilities** in India or roughly **eight million people** already live in cities.
- **Share of people with disabilities:** The number of persons with recognised disabilities as a share of the population could rise due to **disaster and climate risks, demographic changes** and broader definitions of disability in line with global norms.

*Role of Innovative Technology*

- Innovative technology and ICT offer a powerful solution to address these challenges.
  - Both can enable **inclusive urban transformation**, enhancing the quality of life for all citizens.
- India exemplifies this convergence, with its exceptional **digital governance system** and thriving tech sector **driving inclusive prosperity and resilience.**
- The theme of India''s G20 presidency, "**One Earth, One Family, One Future,**" embodies the values of **solidarity and inclusivity.**
- Investments in inclusive innovations are sometimes viewed as **unprofitable**, necessitating the important role of the state in fostering an ecosystem for **transformative technologies**, especially in cases where measuring the return on investment is challenging.

*Collaborative Efforts for Inclusive Urbanization*

- The **first edition of the Smart Solutions Challenge and Inclusive Cities Awards** was hosted in 2022 by the **National Institute of Urban Affairs (NIUA)** in collaboration with the UN in India.
  - It was aiming to **enhance the ecosystem** for assistive technology and inclusive solutions.
- The initiative facilitated the **collection of technology-based solutions** and innovations to address accessibility and inclusion challenges at the city level.
- Smart cities like **Bhubaneswar** have implemented **innovative transportation** and **mobility solutions**.
  - The city demonstrates how technology is utilized to **improve the lives of vulnerable communities.**
- Various solutions and assistive technologies, including **Fifth Sense, IncluMaps, AxcessAble, and myUDAAN**, enable independent living for individuals with disabilities.
- These initiatives, along with others, have the potential to empower cities in localizing innovations for inclusive urbanization.
- Many of these solutions heavily leverage frontier technologies like **AI and machine learning** to tailor solutions according to specific contexts.

*Government Initiatives and Future Outlook*

- The Government of India focuses on **leveraging technological innovations and entrepreneurship** in its development agenda and aligns with **globally agreed SDG targets**.

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- India has established the **Start-up 20 Engagement Group** to facilitate collaboration within the **start-up ecosystem** across member nations of G20.
- The **Ministry of Electronics and Information Technology** has introduced the **G20 Digital Innovation Alliance (G20-DIA).**
    - It aims to showcase innovative solutions and foster collaboration among players in the innovation ecosystem.
- The **Urban-20 Engagement Group** under G20 emphasizes the theme of **"Catalysing Digital Urban Futures".**
    - It aims to explore the **effective and inclusive utilization of data and technology** for city management.

It will take behavioural changes, capacity building, investments in accessible infrastructure, and inclusive and accessible innovations to create an inclusive and accessible India. This will assist in informing policies that will move the nation closer to the inclusive, accessible, secure, resilient, and sustainable India@2047 that Amrit Kaal envisions. A society that makes use of all of its talent will benefit all of India and empower many more people like Manasi Joshi to make the nation proud.

Empowering Anganwadi workers to strengthen ICDS

- India's high prevalence of **stunting, wasting, and anaemia** continues to pose public health risks for children and women.
- To tackle this, India needs to strengthen its current **social sector programmes**, such as the **Integrated Child Development Services (ICDS).**
- The ICDS addresses non-formal preschool education, targets children **aged 0 to 6 years, pregnant women, and lactating mothers**, and ends the cycle of **malnutrition, morbidity, and mortality.**

**Impact of Early Childhood Interventions on Human Capital**
- Empirical research shows a link between **childhood poverty, malnutrition, and insufficient stimulation** and later cognitive and economic challenges.
- Studies have shown that early childhood interventions focusing on **nutrition, education, and health** can significantly improve **human capital**, particularly in developing countries.
- A study published in World Development discovered that the ICDS had a positive impact on **cognitive achievement,** especially for girls and those from families with low incomes.
- Another peer-reviewed study published in The University of Chicago Press Journals discovered that children exposed to ICDS during their **first three years of life** completed **0.1-0.3 grades** more than those who were not.
- Adolescents **aged 13-18 born** in villages with proper ICDS implementation had a **7.8% higher likelihood of school enrollment** and completed an average of 0.8 more grades than their peers who did not have access to the ICDS.
- While we applaud ICDS"s remarkable progress, we must also recognise the **urgent need for a thorough reassessment** of our approaches.

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- Despite **four decades of unwavering effort**, the ICDS continues to face the herculean task of improving **nutrition and health outcomes** for children **aged 0-6 years.**
- Empowering Anganwadi workers is a significant first step towards strengthening the programme.
- Regardless of being the ICDS"s cornerstone, they are frequently pushed to their breaking point. As the primary operatives in the **Poshan 2.0 initiative**, these individuals are responsible for advancing child **nutrition, health, and education in their communities.**
- Their roles range from using modern technology such as **smartphones and apps to performing practical tasks** such as providing **health education, managing feeding programmes, and liaising with auxiliary nurse midwives** and other healthcare professionals.

**Advantages of Empowering Anganwadi Workers**

- To reduce the burden on these workers, an additional Anganwadi worker could be given to each of India"s **13,99,661 Anganwadi centres**.
- Implementing this strategy could result in at least five benefits:

Enhanced Health and Educational Outcomes

- It would lead to better **health and educational outcomes**.
- A large-scale randomised controlled trial conducted in Tamil Nadu to assess the **effects of increasing staff levels** within the ICDS framework yielded significant results.
- The addition of a **half-time employee** effectively doubled the net preschool instructional time, resulting in improved **math and language test scores** for children enrolled in the programme.

Cost-Effective Implementation

- Enrolled Children also exhibited **reduced rates of child stunting** and **severe malnutrition.**

Specialization and Expanded Reach

- The cost of a **nationwide roll-out** of this model is relatively insignificant in comparison to the potential advantages it offers.
- The estimated **long-term benefits**, based on expected improvements in **lifetime earnings**, would be around **13 to 21 times the expenses**.

Specialization and Expanded Reach

- The new Anganwadi worker could be tasked with focusing **only on preschool** and early childhood education, which allows existing workers to devote **more time to child health and nutrition.**
- It would also enable Anganwadi workers to **broaden their reach and serve a greater number** of families.

Job Creation and Empowerment

- Apart from improving the **well-being of rural communities**, this would create job opportunities for **residents, particularly women**.
- It would lead to the **creation of 1.3 million new jobs** for women across India.

**Implementation and Funding of the Saksham Anganwadi and Poshan 2.0 Proposal**

- The **Saksham Anganwadi and Poshan 2.0** proposal''s operationalization is dependent on its status as a **Centrally Sponsored Scheme.**
- State governments are in **charge of its implementation**, which includes **administration, management, and monitoring.**
- As a result, Anganwadi worker **recruitment falls under their jurisdiction**, with regulations and region-specific criteria in place.
- This **decentralised strategy** encourages tailored, efficient implementation.
- The Government of India contributes to the **honorariums of Anganwadi workers and helpers on a cost-sharing basis.**

Aside from that, the data show a significant variation in ICDS implementation and Anganwadi worker skill levels. This necessitates additional investments in the training programme. Furthermore, the importance of infrastructure development in India''s Anganwadi centres cannot be overstated. A troubling 2.5 lakh centres lack functional sanitation facilities, and 1.5 lakh centres lack access to potable water. There are approximately 4.15 lakh Anganwadi centres that do not have their pucca building. To fully realise the ICDS''s potential and address persistent issues, its strategies and implementation must be revisited and re-evaluated. Empowering Anganwadi workers is just the beginning.

## Earth's atmosphere

- Earth's original atmosphere was probably just hydrogen and helium, because these were the main gases in the dusty, gassy disk around the Sun from which the planets formed. The Earth and its atmosphere were very hot. Molecules of hydrogen and helium move really fast, especially when warm. Actually, they moved so fast they eventually all escaped Earth''s gravity and drifted off into space.
- Earth's atmosphere is composed of about 78% nitrogen, 21% oxygen, and 0.93% argon. The remainder, less than 0.1%, contains such trace gases as water vapor, carbon dioxide, and ozone. All of these trace gases have important effects on Earth's climate. The atmosphere can be divided into vertical layers determined by the way temperature changes with altitude. The layer closest to the surface is the troposphere, which contains over 80% of the atmospheric mass and nearly all the water vapor. The next layer, the stratosphere, contains most of the atmosphere's ozone, which absorbs high-energy radiation from the sun and makes life on the surface possible. Above the stratosphere are the mesosphere and thermosphere. These two layers include regions of charged atoms and molecules, or ions. The upper mesosphere and lower thermosphere are called the ionosphere, this region is important to radio communications, because radio waves can bounce off the layer and travel great distances. It is thought that the present atmosphere developed from gases ejected by volcanoes. Oxygen, upon which all animal life depends, probably accumulated as excess emissions from plants that produce it as a waste product during photosynthesis. Human activities may be affecting the levels of some important atmospheric components, particularly carbon dioxide and ozone.

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## Composition of the atmosphere
### Major gases

- The most common atmospheric gas, nitrogen (chemical symbol $N_2$) is largely inert, meaning that it does not readily react with other substances to form new chemical compounds. The next most common gas, oxygen ($O_2$), is required for the respiration (breathing) of all animal life on Earth, from humans to bacteria. In contrast to nitrogen, oxygen is extremely reactive. It participates in oxidation, examples of which include apples turning from white to brown after being sliced, the rusting of iron, and the very rapid oxidation reaction known as fire. Just under 1% of the atmosphere is made up of argon (Ar), which is an inert noble gas, meaning that it does not take part in any chemical reactions under normal circumstances. Together, these three gases account for 99.96% of the atmosphere. The remaining 0.04% contains a wide variety of trace gases, several of which are crucial to life on Earth.

### Important trace gases

- Carbon dioxide ($CO_2$) affects Earth's climate and plays a large support role in the biosphere, the collection of living things that populate Earth's surface. Only about 0.0325% of the atmosphere is $CO_2$. Carbon dioxide is required by plant life for photosynthesis, the process of using sunlight to store energy as simple sugars, upon which all life on Earth depends. Carbon dioxide is also one of a class of compounds called greenhouse gases. These gases are made up of molecules that absorb and emit infrared radiation, which is felt as heat. The solar energy radiated from the sun is mostly in the visible range, within a narrow band of wavelengths. This radiation is absorbed by Earth's surface, then re-radiated back out to space not as visible light, but as longer wavelength infrared radiation. Greenhouse gas molecules absorb some of this radiation before it escapes to space, and re-emit some of it back toward the surface. In this way, these gases trap some of the escaping heat and increase the overall temperature of the atmosphere. If the atmosphere had no greenhouse gases, it is estimated that Earth's surface would be 90°F (32°C) cooler.

- Water vapor ($H_2O$) is found in the atmosphere in small and highly variable amounts. While it is nearly absent in most of the atmosphere, its concentration can range up to 4% in very warm, humid areas close to the surface. Despite its relative scarcity, atmospheric water probably has more of an impact on Earth than any of the major gases, aside from oxygen. Water vapor is an element of the hydrologic cycle, the process that moves water between the oceans, the land surface waters, the atmosphere, and the polar ice caps. Water cycling drives erosion and rock weathering, determines Earth's weather, and sets up climate conditions that make land areas dry or wet, habitable or inhospitable. When cooled sufficiently, water vapor forms clouds by condensing to liquid water droplets, or, at lower temperatures, solid ice crystals. Besides creating rain or snow, clouds affect Earth's climate by reflecting some of the energy coming from the sun, making the planet somewhat cooler. Water vapor is also an important greenhouse gas. It is concentrated near the surface and is much more prevalent near the tropics than in the polar regions.

- Ozone ($O_3$) is found almost exclusively in a layer about 9–36 mi (15–60 km) in altitude. At lower altitudes, ozone gas is irritating to eyes and skin and chemically

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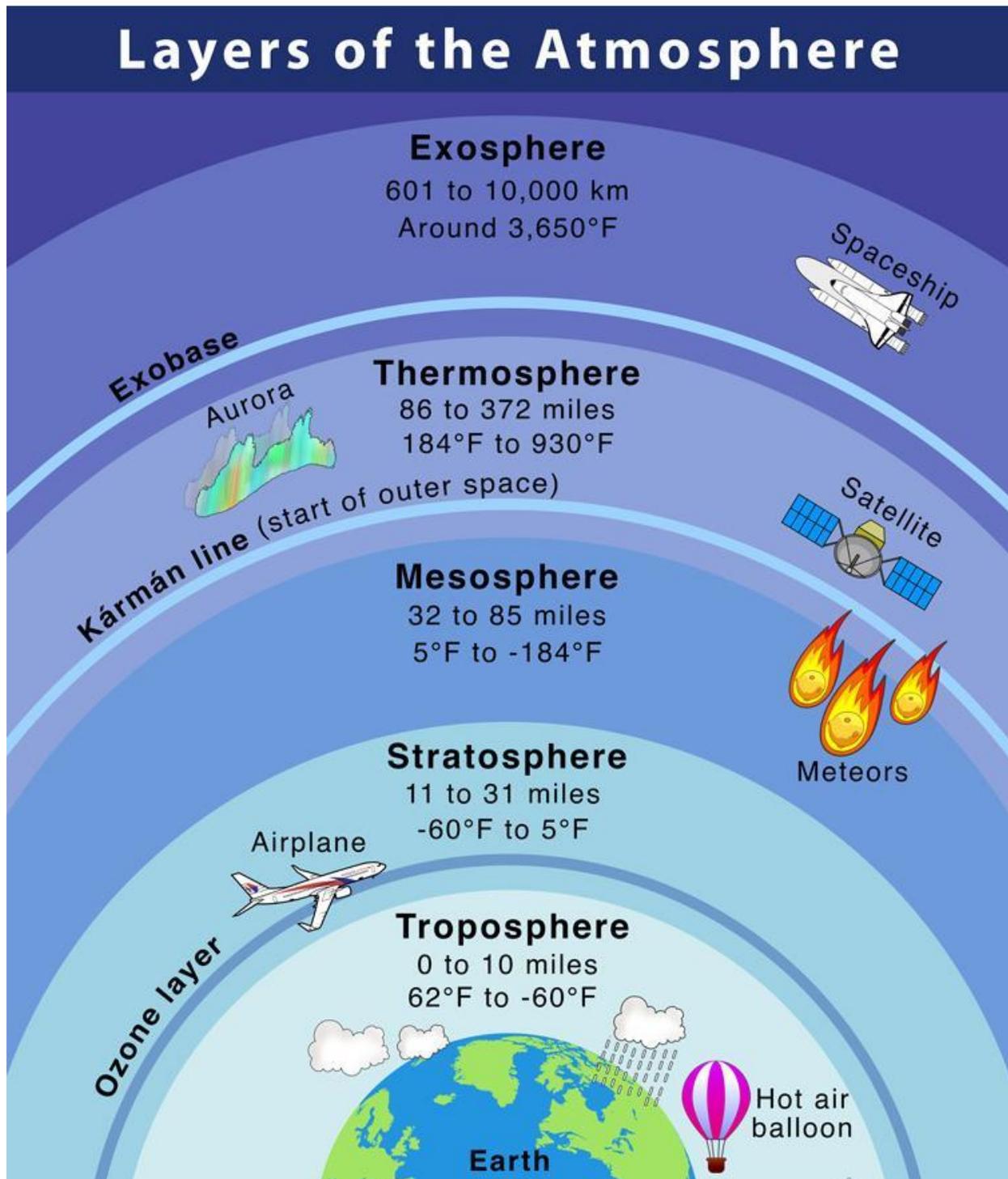Since 2005 - Feel The Pulse of UPSC

attacks rubber and plant tissue. Nevertheless, it is vital to life on Earth because it absorbs most of the high-energy radiation from the sun that is harmful to plants and animals. A portion of the energy radiated by the sun lies in the ultraviolet (UV) region. This shorter wavelength radiation is responsible for suntans and is sufficiently powerful to harm cells, cause skin cancer, and burn skin. The ozone molecules, along with molecules of $O_2$, absorb nearly all the high-energy UV rays, protecting Earth's surface from the most damaging radiation. The first step in this process occurs high in the atmosphere, where $O_2$ molecules absorb very high energy UV radiation. Upon doing so, each absorbing molecule breaks up into two oxygen atoms. The oxygen atoms eventually collide with another $O_2$ molecule, forming a molecule of ozone, $O_3$ (a third molecule is required in the collision to carry away excess energy). Ozone in turn may absorb UV of slightly longer wavelength, which removes one of its oxygen atoms and leaves $O_2$. The free oxygen atom, being very reactive, will almost immediately recombine with another $O_2$, forming more ozone. The last two steps of this cycle repeat themselves but do not create any new chemical compounds; they only act to absorb ultraviolet radiation. The amount of ozone in the stratosphere is small. If it were all transported to the surface, the ozone gas would form a layer about 0.1–0.16 in (2.5–4.0 mm) thick. This layer, as thin as it is, is sufficient to shield Earth's occupants from harmful solar radiation.

**Aerosols**

■ In addition to gases, the atmosphere has a wide variety of suspended particles known collectively as aerosols. These particles may be liquid or solid and are small enough that they may require very long times to settle out of the atmosphere by gravity. Examples of aerosols include suspended soil or desert sand particles, smoke particles from wildfires, salt particles from evaporated ocean water, plant pollen, volcanic dust, and particles formed from the pollution created by coal burning power plants. Aerosols significantly affect atmospheric heat balance, cloud growth, and optical properties.

■ The particles in aerosols cover a wide range of sizes. Raindrops suspended in a cloud are about 0.04–0.24 in (1–6 mm) in diameter. Fine desert sand and cloud droplets range in diameter down to about 0.0004 in (0.01 mm). Sea salt particles and smoke particles are 1/100th of this, about 0.0001 mm, or 0.1 micrometer, in diameter (1 micrometer = one thousandth of a millimeter). Smallest of all are the particles that form when certain gases condense—that is, when several gas molecules come together to form a stable cluster. These are the Aitkin nuclei, whose diameters can be measured down to a few nanometers (1 nanometer = one millionth of a millimeter).

■ The size of some aerosol particles allows them to efficiently scatter sunlight and create atmospheric haze. Under some conditions, aerosols act as collecting points for water vapor molecules, encouraging the growth of cloud droplets and speeding the formation of clouds. They may also play a role in Earth's climate. Aerosols are known to reflect a portion of incoming solar radiation back to space, which lowers the temperature of Earth's surface. Current research is focused on estimating how much cooling is provided by aerosols, as well as how and when aerosols form in the atmosphere.

**Atmospheric structure**

- The atmosphere can be divided into layers based on the atmospheric pressure and temperature profiles (the way these quantities change with height). Atmospheric temperature drops steadily from its value at the surface, about 290K (63°F; 17°C), until it reaches a minimum of around 220K (–64°F;–53°C) at 6 mi (10 km) above the surface. This first layer is called the troposphere and ranges in pressure from over 1,000 millibars at sea level to 100 millibars at the top of the layer, the tropopause. Above the tropopause, the temperature rises with increasing altitude up to about 27 mi (45 km). This region of increasing temperatures is the stratosphere, spanning a pressure range from 100 millibars at its base to about 10 millibars at the stratopause, the top of the layer. Above 30 mi (50 km), the temperature resumes its drop with altitude, reaching a very cold minimum of 180K (–135°F;–93°C) at around 48 mi (80 km). This layer is the mesosphere, which at its top (the mesopause) has an atmospheric pressure of only 0.01 millibars (that is, only 1/100,000th of the surface pressure). Above the mesosphere lies the thermosphere, extending hundreds of miles upward toward the vacuum of space. It is not possible to place an exact top of the atmosphere because air molecules become scarcer until the atmosphere blends with the material found in space.

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## Layers of the Atmosphere

**Exosphere**
601 to 10,000 km
Around 3,650°F

Spaceship

Exobase

**Thermosphere**
86 to 372 miles
184°F to 930°F

Aurora

Kármán line (start of outer space)

Satellite

**Mesosphere**
32 to 85 miles
5°F to -184°F

Meteors

**Stratosphere**
11 to 31 miles
-60°F to 5°F

Airplane

**Troposphere**
0 to 10 miles
62°F to -60°F
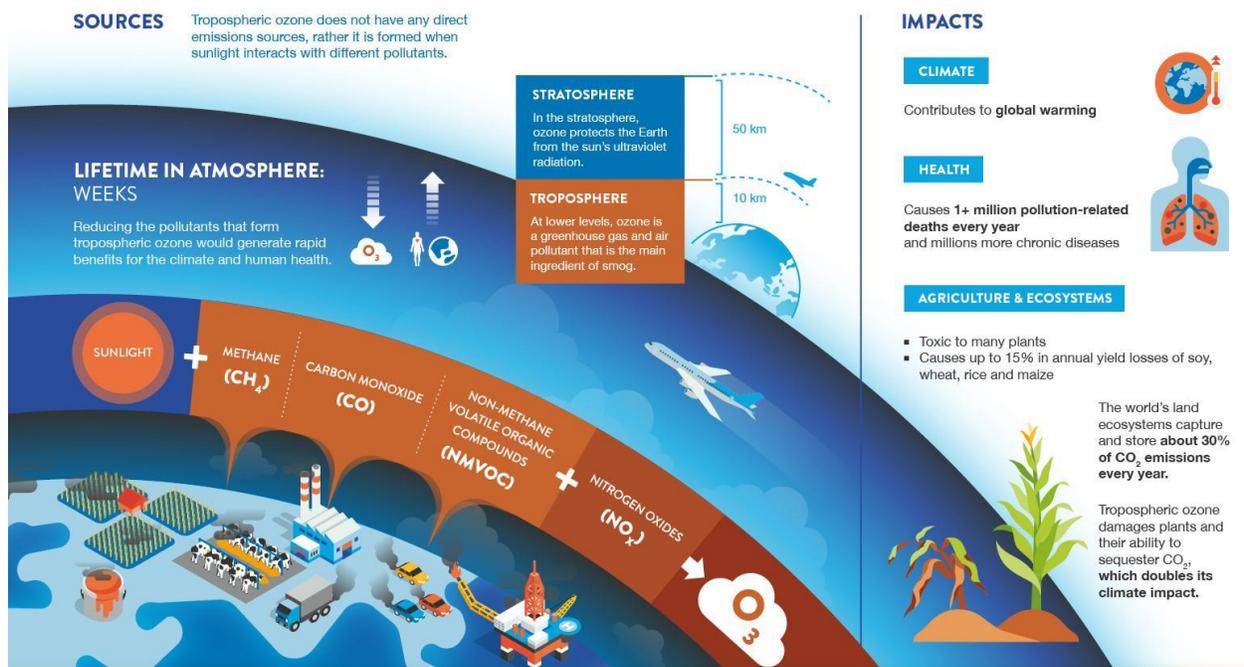
Ozone layer

Hot air balloon

Earth

### The troposphere

■ The troposphere contains over 80% of the mass of the atmosphere, along with nearly all of the water vapor. This layer contains the air we breathe, the winds we observe, and the clouds that bring our rain. All of what we know as weather occurs in the troposphere, the name of which means "changing sphere." All of

the cold fronts, warm fronts, high and low pressure systems, storm systems, and other features seen on a weather map occur in this lowest layer. Severe thunderstorms may penetrate the tropopause.

■ Within the troposphere, temperature decreases with increasing height at an average rate of about 11.7°F per every 3,281 ft (6.5°C per every 1,000 meters). This quantity is known as the lapse rate. When air begins to rise, it will expand and cool at a faster rate determined by the laws of thermodynamics. This means that if a parcel of air begins to rise, it will soon find itself cooler and denser than its surroundings, and will sink back downward. This is an example of a stable atmosphere in which vertical air movement is prevented. Because air masses move within the troposphere, a cold air mass may move into an area and have a higher lapse rate. That is, its temperature falls off more quickly with height. Under these weather conditions, air that begins rising and cooling will become warmer than its surroundings. It then is like a hot-air balloon: it is less dense than the surrounding air and buoyant, so it will continue to rise and cool in a process called convection. If this is sustained, the atmosphere is said to be unstable, and the rising parcel of air will cool to the point where its water vapor condenses to form cloud droplets. The air parcel is now a convective cloud. If the buoyancy is vigorous enough, a storm cloud will develop as the cloud droplets grow to the size of raindrops and begin to fall out of the cloud as rain. Thus, under certain conditions the temperature profile of the troposphere makes possible storm clouds and precipitation.



**TROPOSPHERIC OZONE (O₃)**

Tropospheric ozone is a powerful greenhouse gas and air pollutant that is harmful to human health, agricultural crops and ecosystems.

**SOURCES** Tropospheric ozone does not have any direct emissions sources, rather it is formed when sunlight interacts with different pollutants.

**LIFETIME IN ATMOSPHERE: WEEKS**
Reducing the pollutants that form tropospheric ozone would generate rapid benefits for the climate and human health.

**STRATOSPHERE**
In the stratosphere, ozone protects the Earth from the sun's ultraviolet radiation. 50 km

**TROPOSPHERE**
At lower levels, ozone is a greenhouse gas and air pollutant that is the main ingredient of smog. 10 km

SUNLIGHT + METHANE (CH₄) + CARBON MONOXIDE (CO) + NON-METHANE VOLATILE ORGANIC COMPOUNDS (NMVOC) + NITROGEN OXIDES (NOₓ) → O₃

**IMPACTS**

**CLIMATE**
Contributes to **global warming**

**HEALTH**
Causes **1+ million pollution-related deaths every year** and millions more chronic diseases

**AGRICULTURE & ECOSYSTEMS**
■ Toxic to many plants
■ Causes up to 15% in annual yield losses of soy, wheat, rice and maize

The world's land ecosystems capture and store **about 30% of CO₂ emissions every year.**

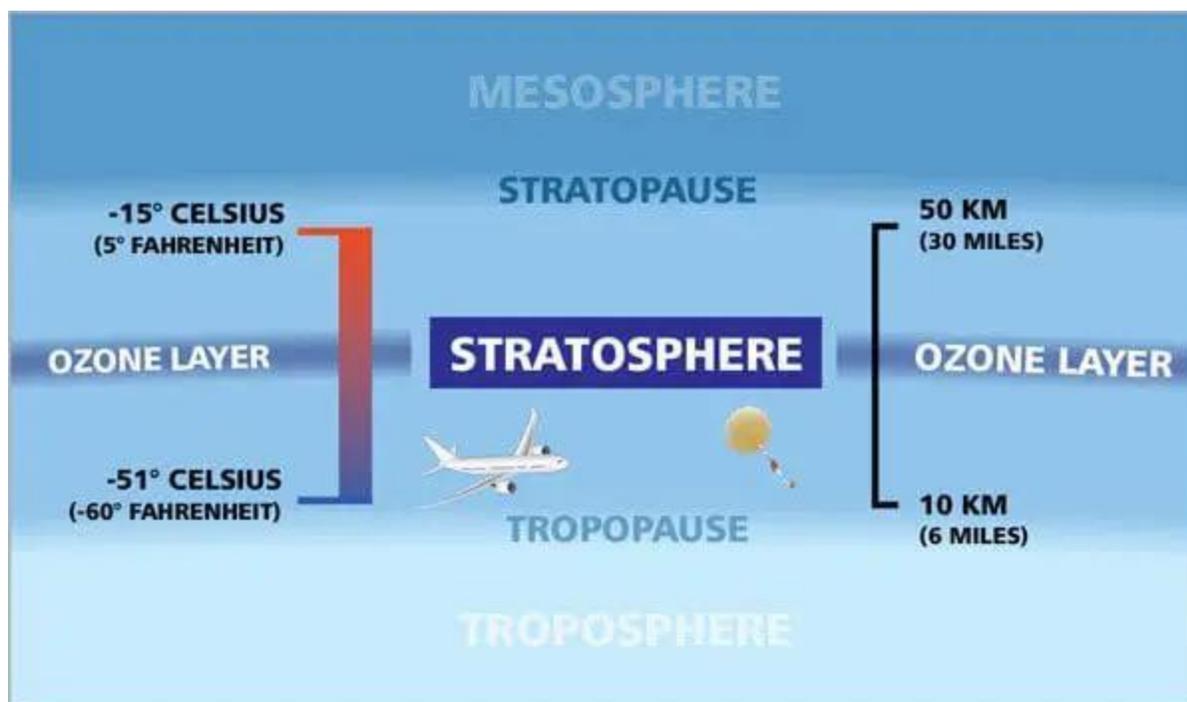Tropospheric ozone damages plants and their ability to sequester CO₂, **which doubles its climate impact.**

■ During a strong thunderstorm, cumulonimbus clouds (the type that produce heavy rain, high winds, and hail) may grow tall enough to reach or extend into

the tropopause. Here they run into strong stratospheric winds, which may shear off the top of the clouds and stop their growth. One can see this effect in the anvil clouds associated with strong summer thunderstorms.
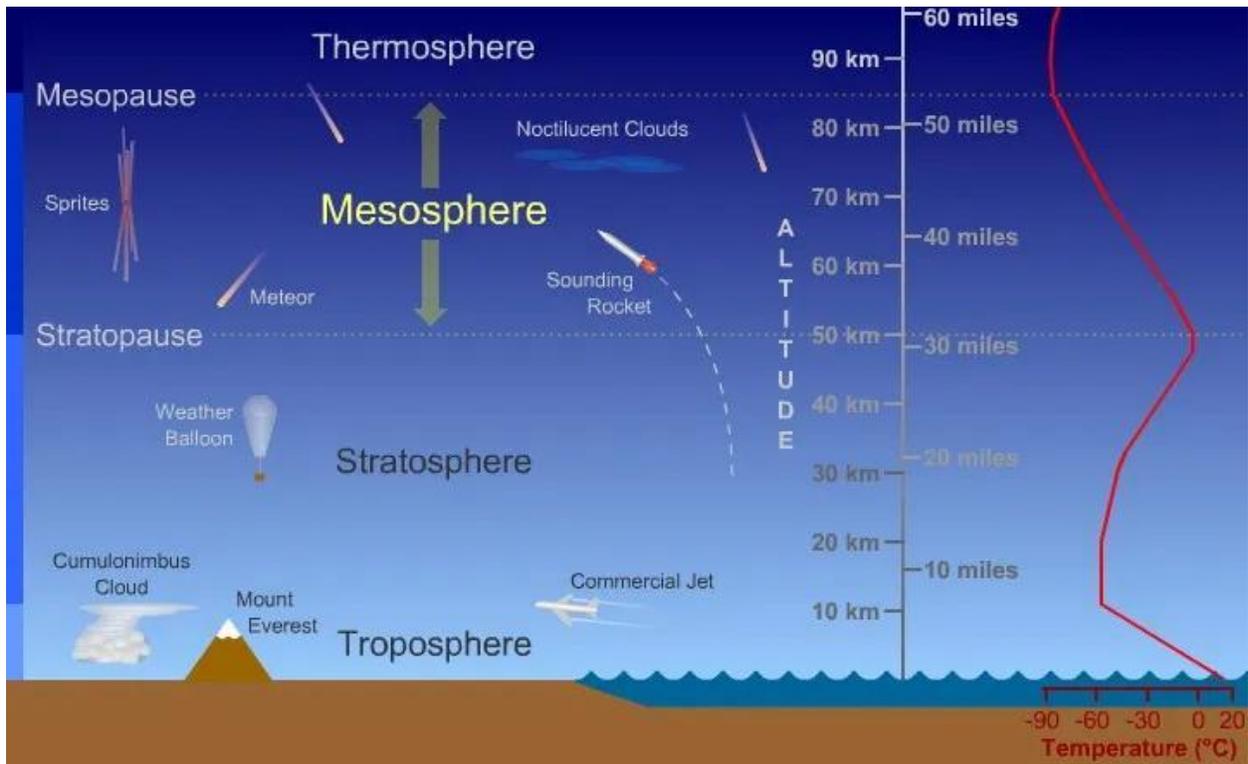
**The stratosphere**

■ The beginning of the stratosphere is defined as that point where the temperature reaches a minimum and the lapse rate abruptly drops to zero. This temperature structure has one important consequence: it inhibits rising air. Any air that begins to rise will become cooler and denser than the surrounding air. The stratosphere is therefore very stable.

■ The stratosphere contains most of the ozone found in Earth's atmosphere, and the presence of ozone is the reason for the temperature profile found in the stratosphere. Ozone and oxygen gas both absorb short wave solar radiation. In the series of reactions that follow, heat is released. This heat warms the atmosphere in the layer at about 12–27 mi (20–45 km) and gives the stratosphere its characteristic temperature increase with height.

■ The ozone layer has been the subject of concern. In 1985, scientists from the British Antarctic Survey noticed that the amount of stratospheric ozone over the South Pole fell sharply during the spring months, recovering somewhat as spring turned to summer. An examination of the historical records revealed that the springtime ozone losses had begun around the late 1960s and had grown much more severe by the late 1970s. By the mid-1980s virtually all the ozone was disappearing from parts of the polar stratosphere during the late winter and early spring. These ozone losses, dubbed the ozone hole, were the subject of intense research both in the field and in the laboratory.

■ Although the stratosphere has very little water, clouds of ice crystals may form at times in the lower stratosphere over the polar regions. Early Arctic explorers named these clouds nacreous or mother-of-pearl clouds because of their iridescent appearance. More recently, very thin and widespread clouds have been found to form in the polar stratosphere under extremely cold conditions. These clouds, called polar stratospheric clouds, or PSCs, appear to be small crystals of ice or frozen mixtures of ice and nitric acid. PSCs play a key role in the development of the ozone hole.

■ The understanding that has emerged implicates chlorine as the chemical responsible for ozone destruction in the ozone hole. Chlorine apparently gets into the stratosphere from chlorofluorocarbons, or CFCs—industrial chemicals widely used as refrigerants, aerosol propellants, and solvents. Laboratory experiments show that after destroying an ozone molecule, chlorine is tied up in a form unable to react with any more ozone. However, it can chemically react with other chlorine compounds on the surfaces of polar stratospheric cloud particles, which frees the chlorine to attack more ozone. In other words, each chlorine molecule is recycled many times so that it can destroy thousands of ozone molecules. The realization of chlorine's role in ozone depletion brought about an international agreement in 1987, the Montreal Protocol, which committed the participating industrialized countries to begin phasing out CFCs.
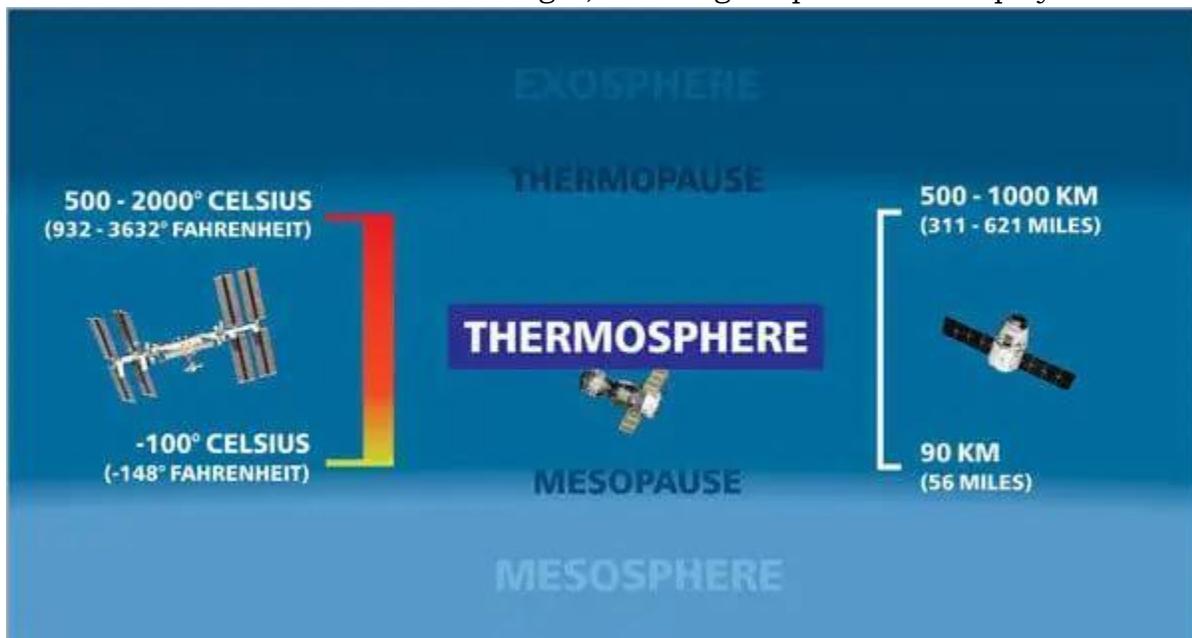
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## The mesosphere and thermosphere

■ The upper mesosphere and the lower thermosphere contain charged atoms and molecules (ions) in a region known as the ionosphere. The atmospheric constituents at this level include nitrogen gas, atomic oxygen, nitrogen (O and N), and nitric oxide (NO). All of these are exposed to strong solar emission of ultraviolet and x-ray radiation, which can result in ionization, knocking off an electron to form an atom or molecule with a positive charge. The ionosphere is a region enriched in free electrons and positive ions. This charged particle region affects the propagation of radio waves, reflecting them as a mirror reflects light. The ionosphere makes it possible to tune in radio stations very far from the transmitter. Even if the radio waves coming directly from the transmitter are blocked by mountains or the curvature of Earth, one can still receive the waves bounced off the ionosphere. After the sun sets, the numbers of electrons and ions in the lower layers drop drastically, because the sun's radiation is no longer available to keep them ionized. Even at night, however, the higher layers retain some ions. The result is that the ionosphere is higher at night, which allows radio waves to bounce for longer distances. This is the reason that one can frequently tune in to more distant radio stations at night than during the day.

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- The upper thermosphere is also where the bright night time displays of colors and flashes known as the aurora occur. The aurora are caused by energetic particles emitted by the sun. These particles become trapped by Earth's magnetic field and collide with the relatively few gas atoms present above about 60 mi (100 km), mostly atomic oxygen (O) and nitrogen gas (N2). These collisions cause the atoms and molecules to emit light, resulting in spectacular displays.

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India, set to become a trillion-dollar digital economy by 2026, faces significant data security needs and challenges. With over a billion people, digitization and burgeoning internet usage, India must protect its citizens' data from vulnerabilities and breaches. However, despite a digitally-forward government and robust IT sector, the country lacks critical infrastructure, comprehensive data protection laws, and effective cybersecurity regulations. Consequently, India grapples with increased cyber threats, placing a spotlight on the urgent need for robust data security measures and the challenges in implementing them.

Data security breach of CoWIN data

- **Data security breach:** There have been recent allegations surrounding a data security breach of CoWIN, the centralized digital platform used in India for COVID-19 vaccination registration. The claims suggest that unauthorized access to the personal data of millions of CoWIN registered users occurred, with this data then being reportedly displayed via a Telegram bot.

- **Sensitive information leaked:** The leaked data is said to include sensitive information such as names, contact details, Aadhaar numbers, and the vaccination status of users. The situation has raised serious concerns about privacy and data protection in India, and highlights the need for robust cybersecurity measures.

- **Indian government response:** The Indian government, and specifically the Ministry of Health and Family Welfare, have denied any data breach. They insist that their security measures for CoWIN are stringent and that no data has been compromised. Despite their assurances, this incident underscores the urgent need for more comprehensive data protection legislation in India.

India needs to focus on Data Security

- **Rapid digitization:** India's rapid digital transformation, especially in government services and the financial sector, necessitates a stronger focus on data security. India's digital public infrastructure, known as India Stack, handles vast amounts of personal data that could be targeted by cybercriminals.

- **Large-scale data breaches:** Over 80 million Indian users were reportedly affected by data breaches in 2021. These breaches can undermine user trust in digital systems, negatively impact the transition to digital services, and cause significant financial damage.

- **Increasing cybersecurity threats:** India witnessed over 674,000 cybersecurity incidents in just the first half of 2022, as reported by CERT-In. This signals an escalating trend in cyber threats.

- **Poor ranking in "Global Cybersecurity Index":** India's low ranking (17 out of 20) in the MIT Technology Review CyberDefense Index 2022/23 is indicative of its inadequate cybersecurity preparedness. The report cited a lack of critical infrastructure and weak cybersecurity regulation as key areas of concern.

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- **Data protection legislation gap:** Despite the Supreme Court's ruling in 2017 that privacy is a fundamental right, comprehensive data protection legislation is still missing in India. This leaves the digital rights and privacy of users exposed.
- **Global tech presence:** Most Indian citizens use foreign-owned social networking sites and mobile devices dominated by foreign manufacturers. This, coupled with the push towards data localization, adds layers of complexity to India's data security landscape.
- **National security concerns:** Governments need access to personal data for national security reasons, but without appropriate data security, this can lead to misuse or compromise of sensitive information.

Data Security ensured in India

- **Digital public infrastructure:** India has established a digital public infrastructure (DPI), known as India Stack. This DPI ensures secure and privacy-respecting digital access to public and private services.
- **Computer Emergency Response Team (CERT-In):** It is the national nodal agency that deals with cybersecurity threats in India. It responds to cybersecurity incidents and strengthens India's response to cybersecurity threats.
- **Regulatory measures:** Even though comprehensive data protection legislation is still pending, India relies on regulations within the Information Technology (IT) Act of 2000 and sector-specific regulations for data privacy and protection.
- **National cybersecurity policy:** India has a national cybersecurity policy that provides a framework for securing cyberspace in the country. It aims to create a cyber-secure environment that allows the robust growth of the IT and digital sectors.
- **Public-private partnerships:** India works with private sector companies to enhance cybersecurity capabilities. The government has established institutions to ensure the continuity of India Stack's operations, acting as a catalyst in developing India's cybersecurity ecosystem.
- **Data localisation:** Some drafts of data protection bills have proposed stringent data localisation provisions, requiring data fiduciaries to store a copy of personal data collected in India. This could help enhance control over data and its security.

Global nations are ensuring Data Security

- **Data protection regulations:** Many nations have established comprehensive data protection laws. For example, the European Union implemented the General Data Protection Regulation (GDPR), which offers stringent guidelines for the collection, storage, and use of personal data. In the United States, individual states like California have rolled out their own privacy laws such as the California Consumer Privacy Act (CCPA).
- **National cybersecurity strategies:** Countries like the United States, the United Kingdom, Australia, and Canada have outlined national cybersecurity strategies. These documents detail government approaches to managing cyber threats, protecting critical infrastructure, and ensuring the security of digital services.

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- **Establishing cybersecurity agencies:**Specific agencies handle cybersecurity in various countries. For example, the United States has the Cybersecurity and Infrastructure Security Agency (CISA), while the United Kingdom operates the National Cyber Security Centre (NCSC).

- **International cooperation:**The European Union, through its cybersecurity agency ENISA, promotes cooperation between member states in the cybersecurity field. Similarly, the "Five Eyes" alliance – comprising the United States, United Kingdom, Canada, Australia, and New Zealand – regularly share intelligence, including cybersecurity threats.

- **Incident response teams:**Many nations, including India with its Computer Emergency Response Team (CERT-In), and South Korea with its Korea Internet Security Agency (KISA), have teams dedicated to handling cybersecurity incidents.

- **Regulation of cybersecurity products and services:**Governments are also putting stricter regulations on the cybersecurity products and services used in their countries. This includes setting minimum security standards and certifying products for their security.

Challenges in ensuring Data Security in India

- **Infrastructure and regulation deficiency:**The MIT Technology Review Cyber Defense Index indicates India has a significant deficit in critical infrastructure, weak cybersecurity regulation, and limited national digital economy adoption, despite having a digital-forward government and one of the world's largest IT-enabled service sectors.

- **Lack of national cybersecurity law and dedicated ministry:**Despite the rising number of cyberattacks and the urgent calls for stronger cybersecurity measures, India currently lacks a comprehensive national cybersecurity law and a ministry dedicated to cybersecurity.

- **Inadequate data protection law:**India's Personal Data Protection Bill of 2019 was withdrawn due to severe criticism over its potential to infringe upon personal data privacy. The country's data protection remains under the IT Act of 2000, which only provides for punishment in cases of negligent data handling. This approach is insufficient for the modern digital era, with its complexities and new types of threats.

- **Resource constraints and firefighting:**Often, resources dedicated to cybersecurity are insufficient, leading to a constant firefighting mode, leaving little time for learning, strategizing, or improving defenses.

- **Reliance on foreign infrastructure**: Most Indian internet users rely on foreign-owned social networking sites and hardware, creating unique national security challenges. This reliance could expose the country to additional cyber threats and data breaches.

Ensuring Data Security in India

- **Establish strong legal frameworks:**As in the European Union's GDPR model, India needs comprehensive legal frameworks to protect personal data and prevent breaches.

- **Cybersecurity Ministry and laws**: Like Australia, India could establish a dedicated Cybersecurity Ministry to oversee and respond to cybersecurity

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threats. Similarly, robust national cybersecurity laws would strengthen India's ability to respond to cyber threats.

- **Invest in infrastructure:** There's a need to build robust digital infrastructure similar to the Netherlands, which is a nerve center for pan-European cybersecurity.
- **Upskill and cross-skill:** To meet evolving threats, India needs to invest in skills development in emerging tech cybersecurity domains. Experts could be trained in adaptive security, cloud security posture management (CSPM), Zero Trust Architecture (ZTA), and quantum cryptography, among other areas.
- **Public-private partnerships:** In line with global best practices, fostering partnerships between government, industry, and academia can help to develop innovative solutions to cybersecurity challenges.
- **Adopt zero trust models:** As recommended by global cybersecurity experts, adopting a Zero Trust Architecture (ZTA) approach, which assumes that no users or devices are trustworthy by default, regardless of their location or network, can help bolster security.
- **Awareness and training:** There should be continuous efforts to increase awareness and training among internet users about data privacy and the steps they can take to protect their own data.
- **Regular cybersecurity audits:** Like many developed nations, India should implement regular and rigorous cybersecurity audits for both public and private entities to ensure that they're adhering to the best practices in data security.

## Semiconductor fab: the unfinished agenda

- Setting up a **semiconductor fabrication plant in India** is not **mere pride**. There is a growing market.
- There are also strategic reasons: India''s susceptibility to coercion increases due to its **reliance on semiconductor imports.**
- As a result, the government''s **2022 Semiconductor Mission** is commendable.
- However, there is still some doubt about whether **India will have a fab.**
- In this context, it is critical to understand why **previous attempts failed** and to consider alternative approaches.

*Earlier Attempts and Challenges in Semiconductor Fab Industry*
**Earlier Attempts**

- **Special Incentive Package (SIP)** was the first serious attempt made in 2007, but it yielded **no** response.
- **Modified SIP** was the second attempt in 2012 fared better.
- India came close to having a fab after over **two years of extensive outreach** with practically all the major fab companies in the world.
- Two consortia were **approved by the Cabinet** with an attractive set of incentives.

- ■ **Jaiprakash Associates** in partnership with **IBM and Israeli company TowerJazz**, and
  - ■ **Hindustan Semiconductor Manufacturing Corporation** along with **ST Microelectronics.**
- ■ The two fabs together involved an **investment of $10 billion**, and also the government offered incentives amounting to **nearly $5 billion** in the form of cash and tax cuts.
- ■ Locations for the fabs were **finalised** and the land was **allotted**.
  - ■ But finally, both failed to **mobilise resources.**

## Challenges

- ■ Semiconductor fabrication represents the **ultimate frontier of human tech advancement**.
- ■ The frontier has been advancing adhering to **Moore's law** that the number of transistors in a unit area doubles **every 18 months**.
- ■ But the progress of miniaturisation is accompanied by **higher complexity and costs**.
- ■ As a result, the industry has seen a **decline in the number of participants**.

## *China"s Dominance and Global Chip Warfare*

- ■ China started late in the **semiconductor fab industry**, but the industry was backed by **massive government financial support** over the last two decades.
- ■ China acquired hundreds of **loss-making fabs** from around the world and built its fab industry.
- ■ Aided by **lower manufacturing costs** and a **massive electronics manufacturing industry**, **China's chip production** has grown rapidly.

## Global Chip Warfare

- ■ The United States is the **traditional leader** in this game, and it realised China had become one of the major producers of chips.
- ■ China was aided by its **market supremacy in rare earths**, which are essential for chip production, it has a strategic **stranglehold on chip-making**.
- ■ **The U.S. and its Western allies** have **blocked** the transfer of the latest fab-related technology to China over the last year.
  - ■ But this could be a case of **closing the stable door** after the horses have bolted.
- ■ The U.S. enacted the **CHIPS and Science Act in 2022**, with nearly **$40 billion in subsidies.**
  - ■ It is to bring back **semiconductor manufacturing** to the country.
- ■ The European Union (EU) sanctioned **€7.4 billion** for a new fab in France.
- ■ India will have to contend with these countries in what has become **intense chip warfare.**

## Challenges in Semiconductor Fab Investment and Development

- ■ Investment in a semiconductor fab is one of the riskiest.
- ■ It requires **billions of dollars** and that too needs to be recovered **before the technology becomes obsolete.**
- ■ This necessitates substantial **production volumes for economic viability**, often reaching levels that are **adequate to meet global demand.**

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- ■ It is therefore difficult to **conceive of a fab** that is based on the **domestic market only.**
- ■ The advantage of semiconductors having a **small freight-to-price ratio and a zero-custom duty regime** under the Information Technology Agreement, 1996.
    - ■ This facilitates production in a **single location and global sales**, and it is why no company is **interested in setting up a greenfield fab.**

*Fab Types and Ecosystem Development*
- ■ Developing an ecosystem for chip manufacturing in a greenfield location is a major challenge.
- ■ Hundreds of chemicals and gases are required for **chip fabrication**, people need to be trained, and abundant clean water be made available.
- ■ But above all is the art of chip-making. Despite the best equipment, **poor quality and low yields** can make fabs fail.
- ■ There are other issues, such as **whether to set up a logic/processor, memory or analog fab.**
- ■ Electronic equipment and its functionalities are characterised by their **logic chips**, which are therefore strategically **important and generate the highest profit.**
    - ■ The most advanced set of technologies is needed to manufacture them.
- ■ **Analog chips** are essential but have the **least strategic value**.
- ■ **Types of Chips Produced by Semiconductor Companies:** Memory Chips, Microprocessors, Graphic Processing Units (GPUs), Commodity ICs, Analog Chips, Mixed Circuit Semiconductors etc.

**Memory fabs vs Analogue fabs vs Logic fabs**
- ■ **Memory fabs** use the **most advanced feature nodes**, whereas **analogue fabs** can be as large as **130 nm.**
    - ■ **Logic fabs** are the most expensive, while analogue fabs are the **least expensive**.

**Assembly, Testing, Packaging, and Marking (ATMP)**
- ■ Assembly, Testing, Packaging, and Marking (ATMP) is a **simpler option for developing the fab** ecosystem before establishing a full-fledged fab.
    - ■ However, ATMPs have little value in **terms of chip manufacturing**.

*Suggestions for India"s Semiconductor Fab Development*
**Acquiring Existing Fabs**
- ■ India's strategy has been to **set up a new logic fab**.
    - ■ Whereas, China acquired **loss-making fabs** and then set up its logic fab.
- ■ **Advantages of acquiring existing fabs:**
    - ■ Reasonably priced.
    - ■ Stabilised technology,
    - ■ Supply chain ecosystem,
    - ■ Established product line, and
    - ■ Market.
- ■ Acquiring existing fabs will enable India to build a **fab ecosystem and train human resources.**

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■ Because of this much lower subsidies would be required, and the funds can be diverted for **advanced R&D in fab technologies** which will help build **state-of-the-art fab** in the next few years.

**Setting up ATMPS**

■ Another strategy could be **setting up ATMPs**.
■ Tessolve had set up an ATMP in 2013-14 and is now **acquired by Tatas**.
■ This ATMP is successfully packaging chips up to **7 nm feature size**.
■ China has over **100 ATMPs.**

According to a Chinese proverb, "The best time to plant a tree was 20 years ago, but the second-best time is now." China started on the fab journey about 20 years ago. India might have missed the earlier opportunities to explore Semiconductor Fab Development. But India can now focus on its Semiconductor Industry to cater for its domestic needs and global market.

## Unwrapping the Potential of Precision Fermentation

■ Precision fermentation is an innovative technology that holds great promise for the food industry. By programming microorganisms to produce specific proteins and ingredients, it offers numerous advantages such as sustainable foods and pharmaceutical products, reduced environmental footprint, and potential solutions to food crises. However, precision fermentation also faces challenges related to regulation, safety, public perception, and its impact on traditional agriculture. Balancing these advantages and challenges is crucial for its successful implementation.

■ Precision fermentation is a cutting-edge technology that combines traditional fermentation methods with precision biology techniques. It involves programming microorganisms, such as yeast, to produce specific proteins by inserting genetic instructions or DNA sequences into their cells. These engineered microorganisms then act as factories, producing desired proteins without the need for traditional agricultural methods or animal sources. Precision fermentation offers the potential for sustainable and scalable production of animal-free proteins with identical taste, texture, and functionality to conventional counterparts.

| Traditional | Biomass | Precision |
|---|---|---|
| ▪ **Traditional fermentation** uses intact **micro-organisms** to produce **nutritious end-product** with upgraded **sensory properties** | ▪ **Biomass fermentation** utilizes **microbial components** to produce **nutritious end-products** i.e. substrate is provided to microbes and microbes themselves are the final products | ▪ **Precision fermentation** utilizes **microbes** to **produce specific ingredients**. The **genes** for the components maybe **spliced** into the **genome** of the microbe |

Potential applications of precision fermentation

■ **Pharmaceutical applications:** Precision fermentation has been successfully used in the production of pharmaceutical products, such as insulin and other life-saving drugs. By using microbial fermentation to produce these drugs, it

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eliminates the need for animal-based sources and ensures a more consistent and reliable supply.

- **Alternative proteins:** Precision fermentation has enabled the production of alternative proteins that can mimic the taste, texture, and nutritional profile of animal-based proteins. Companies have developed animal-free milk and egg proteins through precision fermentation, providing sustainable and ethical alternatives to traditional animal agriculture.

- **Novel food ingredients:** Advanced fermentation technologies have been utilized to create novel food ingredients that offer unique properties and benefits. For example, companies have produced plant-based heme protein (leghemoglobin) through precision fermentation, which provides the distinctive flavour and color of meat. This has paved the way for the development of plant-based meat alternatives with enhanced sensory characteristics.

- **Industry growth and investments:** The precision fermentation industry has witnessed substantial growth and investment in recent years. Numerous startups and companies are dedicated to advancing precision fermentation technologies, and investments in the sector have been increasing. This growth indicates the growing recognition of precision fermentation as a viable solution for addressing food system challenges.

Why?

- **Food crisis and insecurity:** Traditional farming won't be able to provide all of the world's food needs because there isn't enough land available and the population is expanding daily.

- **Environmental degradation:** Conventional agriculture practices contribute to deforestation, soil erosion, and the depletion of natural resources. Precision fermentation can help reduce the environmental impact by minimizing land use, water consumption, and the need for chemical inputs, thus mitigating environmental degradation.

- **Water crisis:** Agriculture is a major consumer of freshwater resources. Precision fermentation requires less water compared to traditional farming methods, making it a potential solution to mitigate water scarcity and reduce the strain on water supplies.

- **Climate change issue:** Greenhouse gas emissions associated with livestock farming and conventional crop cultivation are responsible for climate change.

- **Animal cruelty:** Animal agriculture often raises concerns about the ethical treatment of animals. Precision fermentation is devoid of such concerns.

Advantages of precision fermentation

- **Sustainable food production:** Advanced fermentation technologies offers a more sustainable alternative to conventional agricultural methods, reducing land use, water consumption, and greenhouse gas emissions. It provides a way to address the environmental impact of traditional farming practices.

- **Animal welfare and ethics:** Precision fermentation allows for the production of animal-free proteins, eliminating the need for raising and slaughtering animals. It aligns with the ethical concerns and increasing demand for cruelty-free food options.

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- **Innovation and economic opportunities:** Precision fermentation represents a technological innovation that opens new avenues for economic growth and job creation. It fosters the development of a bio-based economy, with opportunities in research and development, manufacturing, and commercialization of precision fermentation-based products.
- **Food security and global nutrition:** Precision fermentation can contribute to food security by providing a scalable and efficient method of protein production. It offers the potential to meet the nutritional needs of a growing population, especially in regions where access to traditional protein sources is limited.
- **Climate change mitigation:** Precision fermentation reduces the environmental impact of food production by minimizing deforestation, soil degradation, and methane emissions from livestock. It helps in mitigating climate change by promoting more sustainable practices.

Issues w.r.t. precision fermentation

- **High production costs:** Currently, precision fermentation technologies can be costly, making the products derived from them more expensive compared to conventional alternatives. This pricing disparity poses a challenge to widespread adoption and market accessibility, particularly in terms of affordability for consumers.
- **Regulatory and safety considerations:** As Advanced fermentation technologies involves genetic engineering and the use of genetically modified organisms (GMOs), there are regulatory and safety considerations. Ensuring the safety of novel proteins and ingredients produced through precision fermentation is crucial, and comprehensive testing and evaluation processes are necessary to address any potential risks to human health and the environment.
- **Ethical and societal implications:** Advanced fermentation technologies raise ethical questions related to the use of genetically modified organisms, particularly in food production. Some individuals may have ethical objections to consuming foods derived from GMOs, highlighting the need for transparency and clear communication about the technology and its applications.
- **The concentration of power:** There is a concern that precision fermentation, like other innovative food technologies, could lead to the concentration of power in the hands of a few large corporations. This concentration could potentially limit market competition and hinder small-scale producers or new entrants in the industry, impacting diversity and innovation.
- **Impact on traditional agriculture:** The widespread adoption of precision fermentation and alternative protein sources could potentially disrupt traditional agricultural sectors, including livestock farming and crop production. This may have socioeconomic implications for farmers and communities dependent on these industries, requiring transition strategies and support.

Looking ahead

- **Robust regulatory framework:** Establishing a comprehensive regulatory framework specific to precision fermentation is essential. This includes rigorous safety assessments, labelling requirements, and guidelines for the approval and commercialization of products derived from this process.
- **Scientific advancements:** Ongoing research and development are needed to enhance the efficiency, scalability, and cost-effectiveness of precision

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fermentation processes. Advancements in precision biology, genetic engineering, and fermentation techniques can optimize the production of animal-free proteins.

- **Collaboration and diversity:** Encouraging collaboration among stakeholders, including precision fermentation companies, traditional farmers, policymakers, researchers, and consumer groups. This can facilitate a balanced and diverse food system. Supporting small-scale producers, startups, and innovators in entering the precision fermentation sector can foster competition, innovation, and prevent the concentration of power.
- **Consumer acceptance and education:** Building consumer awareness and understanding of precision fermentation is essential for the wider acceptance of animal-free proteins. Educating the public about the benefits, safety, and sustainability aspects of fermentation can contribute to its adoption.
- **Ethical considerations:** This includes addressing concerns about the use of genetically modified organisms and ensuring responsible practices throughout the production and supply chain. Promoting ethical guidelines and practices, such as sustainable sourcing of ingredients and fair trade principles, can contribute to the ethical implementation of precision fermentation.

## Rethink the retention of sedition

- According to the **National Crime Records Bureau** (NCRB), the **number** of cases registered only under **Section 124A IPC** was **zero** in the years **2015**, **2016**, **2017**, and **2020**.
    - This has ranged from **one** to a **maximum three** between the years **2014** and **2021**.
- According to a government data, **326 sedition cases** were registered across the country between **2014** and **2019** and only **six persons** were convicted of these.
- According to a government data, under the title "offences against the State" there were a total of **179 arrests** made for sedition.
    - However, **no charge sheets** were filed by the **police** in over **70**% of the cases, and only **two** convictions were given during this time period.

*Law Commission on Section 124A of the Indian Penal Code*

- The **Law Commission** of India in its **279th report** has recommended the retention of **Section 124A** of the Indian Penal Code (**IPC**) on 'sedition'.
- According to the Law Commission the retention of section was necessary as it was useful in **countering** the **threat** to **India's internal security**.
- The **Law Commission** has stated that the **Unlawful Activities (Prevention) Act (UAPA), 1967**, does **not** cover all elements of the **offence** as envisaged under **Section 124A IPC.**
- The **Law Commission** has recommended certain **procedural guidelines** to **prevent** the **misuse** of Section 124A IPC.

*Supreme Court on Section 124A of the Indian Penal Code*

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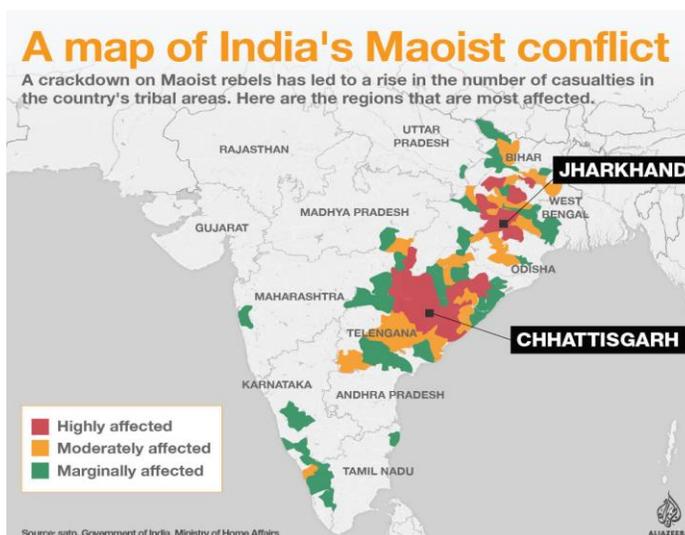Since 2005 - Feel The Pulse of UPSC

- In "**S.G. Vombatkere v. Union of India case**" the Supreme Court of India had **directed** all **State** and the Central government to keep in suspend all pending trials, appeals, and proceedings with regard to **Section 124A IPC.**
- The **Supreme Court** was of view that this Section was **not** in tune with the current social culture.

## *Maoist and necessity of Section 124A of the Indian Penal Code*

- According to the data from the Ministry of Home Affairs, the **number** of **Maoist** incidents ranges from **1,533** in **2004** to **509** in **2021**.
  - The fatality has varied from **566** to **147** during the same period.
- The **central agenda** of the **Maoists** is to capture **political power** by overthrowing the **democratically** elected government through a protracted **armed struggle.**
  - This is the reason government need to tackle them **stringently**.
- Despite **decrease** in the overall Maoist violence in the recent years, **Chhattisgarh** still reports the maximum number of Maoist incidents.
- The use of **Section 124A IPC** in fighting **Maoism** has been **negligible**.
- The use of **Section 124A IPC** in fighting **Maoism** has been **negligible**.
- The cases registered under the **Unlawful Activities (Prevention) Act (UAPA), 1967** were close to **three per year** between the years **2014** and **2021**.
- As the use of **Improvised Explosive Devices** (IED) and resorting to **ambush attacks** has remained the most used **weapons** by the Maoists, the most used **provisions** are sections under the **Explosive Substances Act** and the **IPC**.
- In some cases, the State law such as **the Chhattisgarh Vishesh Jan Suraksha Adhiniyam (Chhattisgarh Special Public Safety Act), 2005**, is applied to **curb** unlawful activities by the Maoists.

## *UAPA and Section 124A of IPC*

- The '**unlawful activity**' defined under **Section 2(1)(o)** of the UAPA includes 'any action taken by such **individual** or **association** which causes or is intended to cause **disaffection** against India'.
- The **punishment** prescribed is **imprisonment** for up to **seven years** and a **fine**.
- The **difference** between **Section 124A IPC** and this provision of the **UAPA** is that in place of the words '**Government established by law in India'**, the word '**India'** is used in the UAPA.
- The Supreme Court has stated that '**criticising government'** does **not** fall within the **ambit** of sedition.



A map of India's Maoist conflict
A crackdown on Maoist rebels has led to a rise in the number of casualties in the country's tribal areas. Here are the regions that are most affected.

Highly affected
Moderately affected
Marginally affected

Source: satp, Government of India, Ministry of Home Affairs

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- ■ The '**unlawful activity**' as defined in the **UAPA** are more frequently used.
- ■ Any **hurdle** before any such **prosecution** under the UAPA that requires **Central government's** sanction can be removed by using **Section 45** of the **UAPA** that authorises **State governments** to act and **grant** sanction for **prosecution**.

## WHAT THE APEX COURT SAID

This government has been scrapping many obsolete laws. We don't know why they are not looking into this law? Continuance of this law is a serious threat to liberty

- The enormous power of misuse of this section can be compared with a carpenter with a saw. Instead of cutting a tree, he cuts the entire forest

- There is no dispute that it is a colonial law and was used by the British to suppress freedom and was used against Mahatma Gandhi... Is this law still needed after 75 years of Independence?

HT

## WHAT IS SECTION 124(A)?

Under Section 124A of IPC, the offence of sedition is committed when any person by words or otherwise brings or attempts to bring into hatred or contempt, or excites or attempts to excite disaffection towards, the govt established by law

- The penal provision is punishable with a jail term ranging between three years to life term

## LOW CONVICTION RATE

- Between 2016 and 2019, the number of sedition cases rose by 160% to 93
- But in 2019, the conviction rate was 3.3%
- This means just 2 of the 93 accused were convicted

# Evolution of the law

## Sedition is a cognisable, non-bailable and non-compoundable offence under Section 124A of Indian Penal Code

### BEFORE INDEPENDENCE

**1870:** The section on sedition is introduced by the British to the IPC

The British rulers used the law to muzzle demands for freedom. For instance, Bal Gangadhar Tilak was the first person to be convicted of sedition in colonial India.

### AFTER INDEPENDENCE

**1948:** In discussions, Indian leaders agree to drop "sedition" from the Constitution

**1949:** "Sedition" is no longer part of the Indian Constitution adopted on November 26 this year. However, Section 124A remains in the IPC

**1951:** Nehru govt brings in first amendment under Article 19(1)(a), and puts in "reasonable restrictions" on the right to free speech

**1974:** Indira Gandhi govt makes Section 124A a cognisable offence that authorises police to make arrests without a warrant

### PRESENTLY

2019 data shows that sedition cases rose by 25% and arrests by 41% over the previous year. However, only 3% of cases led to convictions

### *Placing Sedition under Preliminary inquiry*

- The **procedural guidelines** for conducting a **preliminary inquiry** to check whether some **cogent evidence** are in **conflict** with the established **jurisprudence** of writing the **First Information Report** (FIR), was settled by Supreme Court in **Lalita Kumari v. Govt. of Uttar Pradesh and others** (2014).

- So, if information given to a **police station** discloses the **commission** of a **cognisable** offence, the **officer-in-charge** has to register an **FIR** to commence **investigation**.

- A **preliminary inquiry** is permissible only in **cases** such as commercial, matrimonial, related to medical negligence or corruption and that do **not** disclose the basis of a **cognisable offence**.

- Even if it is assumed that a case of **sedition** could fall under such a category, the purpose of such an inquiry **cannot** be to ensure whether **cogent evidence** exists to support the **allegations**.

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- If such a provision is **inserted** by an amendment to the **Code of Criminal Procedure** (CrPC), there is **likelihood** of such an amendment being in conflict with the **Article 14** of the Constitution and declared **arbitrary** by the Supreme Court.
    - **Article 14** states that "The State shall not deny to any person equality before the law or the equal protection of the laws within the territory of India."
- Similar could be the result of the **provision** that mandatorily seek **permission** from the Central or the **State** government before registering an **FIR**.

It would be more democratic if all State and Central governments deliberate on the Law Commission's report and public sought opinion to arrive at a more participative and agreeable decision. The **United Kingdom** has abolished the law on **sedition** by an **Act** of **2009,** thus India should also rethink the existence of a colonial law in an independent India.

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**Manipur burning**

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- Union Home Minister Amit Shah announced that a **probe panel** led by a **retired High Court judge** will investigate the **recent violence in Manipur** that led to the death of at least 80 people and left several injured. He said the reasons behind the **month-long bout of violence** and those responsible for it will be probed.
- Shah held a press conference towards the end of his four-day visit in the state that began on 29 May 2023, and announced **several measures for the state.** He met victims from both the **Meitei and Kuki communities** of the state a day earlier in relief camps, assuring them of **adequate security**, and said the government's focus is to ensure their safe return home.

**What is happening in Manipur?**
- **Ethnic clashes** broke out in the state nearly a month ago after a '**Tribal Solidarity March**' was organised in the hill districts to protest the **Meitei community's demand for Scheduled Tribe (ST) status**.
- The trigger for the violent clashes was a **contentious order of the Manipur High Court** that boosted a longstanding demand by the **valley-dwelling Meiteis to be designated as a ST** in order to protect their "**ancestral land, traditions, culture and language**". Protests by tribal groups such as the **Kukis against the HC order** in all the hill districts on 3 May 2023 led to violence, first in **Kuki-dominated Churachandpur**, and then **in the Imphal valley**.
- After a relative lull for over a fortnight, the **state witnessed a spurt in clashes and gunfights** between militants and security forces. Officials in Manipur said that there had been a direct confrontation between armed militants and the Manipur Police in five different areas on the outskirts of Imphal Valley.
- Amid **ethnic tension in the state**, IPS officer Rajiv Singh of the Tripura cadre (1993 batch), was given **charge of the post of Director General of Police (DGP) in Manipur** on 29 May 2023.

**What has Amit Shah announced regarding the situation in Manipur?**

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- Shah said during his visit he went to **temporary shelters**, he visited Imphal, Moreh, Churachandpur, and Kangpokpi, and spoke to cabinet members, **leaders of 11 political organisations**, **women's organisations**, **Meitiei and Kuki civil society organisations**, professors and retired officers. Apart from the formation of the probe panel, he announced some other measures:
- Under the **chairmanship of Manipur governor Anusuiya Uikey**, the Indian government will form a **peace committee** which will have "**representation of everyone** – industrialists, sportspersons, political party's representatives, elected representatives and those from civil society organisations.
- For **better coordination between security agencies in the state**, security advisor Kuldiep Singh, Director General of the Central Reserve Police Force, will oversee an **inter-agency unified command**.
- Of the **cases of violence** that have been registered, **six have been selected for investigation by a special CBI team.** This includes one case for the charge of general conspiracy.
- A **relief and rehabilitation package** has been readied. For every person who has lost their life, **Rs 10 lakhs will be given** (with half of the amount by the Central government and the other by the Manipur government). Their family members will receive it via **Direct Benefit Transfer (DBT) into their bank accounts.** For those who have been injured or suffered a loss of property, a detailed announcement on this will come from the Central government tomorrow.
- A **Joint Secretary-level officer** and **five Director-level officers** will be present here to monitor these works.
- Fencing of around **10 km of the Myanmar-Manipur border** has been done and tendering has been done for **80 km of the border**. The survey work for the rest of its length will be started. Biometric and eye scans of those coming from abroad will be carried out, so that there is no "**violence caused by instigation**.
- Shah said **30,000 metric-tonne of rice will be provided to Manipur** for the next two months. **Gas, petrol and vegetables** will also be brought in. For their distribution, along with existing shops selling cheaper grains, a camp will also be opened where people can get food items through both ration cards and by purchasing them. **Medicines will be made available here.** Some 15 petrol pumps will be kept open during the night and day.
- To address the **issues of holding competitive exams** and to keep educational institutions going, a plan is also being formulated and will be out in two days. Options such as **online education** are being discussed. For courts too, **virtual hearings and appearances** are being planned.
- From **Moreh**, **Churachandpur** and **Kangpokpi**, a **helicopter service** will help in transportation, at the **cost of Rs 2,000 per person** to take people to the airport. The cost will be borne by the state and central government.

## Medicines Patent Pool (MPP)

- The Medicines Patent Pool (MPP) has entered into sub-licence agreements with Indian and Indonesian companies to produce generic versions of the cancer drug Nilotinib.
- Nilotinib is used in the treatment of chronic myeloid leukaemia, a type of blood cancer.

### What is Medicines Patent Pool (MPP)?

- **Mission and Purpose:** The MPP is a United Nations-backed organization focused on increasing access to life-saving medicines for low- and middle-income countries.
- **Addressing IPR:** The MPP works to overcome barriers related to intellectual property rights and patents that limit the availability and affordability of essential medicines.
- **Voluntary Licensing Agreements:** The MPP negotiates voluntary licensing agreements with pharmaceutical companies to allow the production of generic versions of patented medicines.
- **Production of Affordable Generics:** By securing licenses, the MPP enables qualified manufacturers in low- and middle-income countries to produce and distribute affordable generic medicines.

### Need for MPP

- **Collaborative Approach:** The MPP collaborates with governments, non-profit organizations, civil society groups, and pharmaceutical companies to address global health challenges and promote access to medicines.
- **Focus on Priority Diseases:** The MPP's efforts are particularly significant in diseases like HIV/AIDS, tuberculosis, hepatitis C, and other priority areas where access to affordable medications is crucial.
- **Sustainable Supply of Generic Medicines:** Through licensing agreements, the MPP ensures a sustainable supply of quality-assured generic medicines, promoting market competition and expanding treatment options.
- **Improving Health Outcomes:** The MPP's work reduces the burden of high drug costs and enhances access to life-saving treatments, ultimately improving health outcomes and saving lives.
- **Benefit for Low- and Middle-Income Countries:** The MPP's initiatives directly benefit patients in low- and middle-income countries by increasing access to affordable medicines and reducing disparities in healthcare.

### Recent agreements signed

- **Licence Agreement with Novartis:** In October 2022, the MPP signed a licence agreement with Novartis Pharma AG, the Switzerland-based pharmaceutical corporation that holds the patent for Nilotinib.
- **First Sub-Licence Agreements:** The recent sub-licence agreements with Indian companies Eugia, Hetero, and Dr. Reddy's Laboratories, along with the Indonesian firm BrightGene, mark the first such agreements for a cancer treatment drug by the MPP.

### Benefits

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- **Generic Versions of Nilotinib:** The licensed manufacturers can produce generic versions of Nilotinib.
- **Manufacturing:** The selected manufacturers have the rights to manufacture generic Nilotinib in India and seven middle-income countries.
- **Supply in 44 Territories:** The non-exclusive licence agreement allows for the supply of generic Nilotinib in 44 territories covered by the agreement, subject to local regulatory authorisation.
- **Affordable Treatment Option:** Charles Gore, the executive director of the MPP, states that the production of generic Nilotinib will provide an affordable treatment option for people diagnosed with chronic myeloid leukaemia in the covered countries.
- **Increasing Access to Cancer Medication:** The MPP's initiative aims to improve access to essential cancer medications by reducing costs and increasing availability.

## India-US ties: Trust & Necessity

- In March 2000, **Bill Clinton** visited India and became the **first US President** to visit India in **22 years.**
    - His visit was significant because it was the **first visit of the US president** after the Nuclear Tests by India.
- After almost 22 years now, the Indian Prime minister has been on a **State visit to the United States.**
- This state visit is important to enhance the India-US ties in various sectors and to deepen the trust between both countries.

*NSG Waiver to Initiative for Critical and Emerging Technologies (iCET)*
- In September 2008, after the **Nuclear Suppliers Group's (NSG)** waiver to the **Indo-US nuclear deal**, the Indian Prime Minister said, "It marks the end of India's **decades-long isolation** from the nuclear mainstream and technology denial regime."
- In June 2016, the Indian Prime Minister told the US Congress that India and the US have overcome **"the hesitations of history"**, and called for **ever-stronger economic and defence ties.**

**Initiative for Critical and Emerging Technologies (iCET)**
- In May 2022, the overcoming of the "hesitations of history" developed into the Initiative for Critical and Emerging Technologies (iCET).
- The initiative was led by **India's National Security Advisors and American political advisor**.
- iCET was started in **January 2023.**
- It is looking at technologies to be shared in critical sectors such as **defence, space, semiconductors, artificial intelligence, and quantum computing**.

*India-US Relations under different Presidents and PMs*
**Recent State Visit by Indian Prime Minister**

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- It will be the first State Visit of Indian Prime Minister Narendra Modi.
  - He is only the **third Indian leader** after former **President Sarvepalli Radhakrishnan** and **former Prime Minister Manmohan Singh** to have this privilege.
- The initiative on sharing **critical and emerging technologies** between **"trusted geographies"** is going to be a key element of the conversation during his state visit.
- During this visit he will address a **joint meeting of Congress** for the **second time**.
- The bilateral relationship has drawn on the current geopolitical situation, **US strategic and economic concerns**, India"s **political and diplomatic positioning**, and the slow process of **building trust** that has overcome the many challenges before the two democracies.

**Nuclear Tests and Global Response**
- After the **nuclear tests of 1998**, Prime Minister Atal Bihari Vajpayee faced global criticism including from the US President.
  - Indian PM explained India's position in a letter written to **President Bill Clinton.**
- The nuclear test may have retarded India's relationship with the **US and the West** somewhat but now the relations have begun to crystallize into a **mutually beneficial and substantive relationship.**
- **Jaswant Singh**, then Foreign Minister of India and **Strobe Talbott's** talks led to President Clinton's visit in March 2000.
  - In the years that followed, the relationship **strengthened and matured.**

**Ties Under Bush and Obama**
- In **George W Bush's tenure** the **Indo-US nuclear deal**, elevated ties to a higher strategic trajectory.
  - **Under his Presidency** the **global financial crisis hit,** and the **26/11 terrorist attacks** on Mumbai followed soon afterwards.
- **During Barack Obama's Presidency** ties stayed the course, he became the **only President** to visit **India twice**.
  - He hosted both **Prime Ministers Manmohan Singh and Narendra Modi** at the White House.

**Ties under Trump and Biden**
- **Under Donald Trump's presidency** ties **remained unpredictable** but ties continued to strengthen.
  - Quad framework was revived in his term, and the **defence partnership was strengthened** with the signing of the foundational agreements.
  - He visited India just before the Covid-19 pandemic.
- **In present Biden's Presidency** Ties have maintained their rhythm, especially on the **Indo-Pacific strategy.**
  - However, the chaotic US exit from **Afghanistan left India vulnerable** at a time when India faced challenges along **two of its borders**.

*Strategic Partnership and Defense Cooperation*

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- **Depth and breadth** in the India-US relationship have been acquired in the **last couple of decades.**
- India and US signed multiple agreements to provide the legal framework for enhanced interaction and exchange of information between the two militaries.
- These agreements include-
    - **Logistics Exchange Memorandum of Agreement (LEMOA, 2016)**
    - **Communications Compatibility and Security Agreement (COMCASA, 2018)**
    - **Basic Exchange and Cooperation Agreement (BECA, 2020)**
- LEMOA allows the two militaries to access **supplies, spare parts, and services** at each other's bases.
- COMCASA allows the US to provide India with its **encrypted communications equipment** and systems so that Indian and US military **commanders, aircraft and ships** can communicate with each other through secure networks in **peace and war.**
- BECA allowed India to use **US geospatial intelligence** and enhance the accuracy of **automated systems and weapons** like missiles and armed drones.
- **Other signed defence pacts:** Industrial Security Agreement (ISA, 2019) and Memorandum of Intent on Defence Innovation Cooperation (2018).
- **India-US Defence Industrial Cooperation Roadmap** is expected to fast-track technology cooperation and co-production in areas of mutual interest.
    - It is expected to be announced during the upcoming state visit of the Indian PM.
- Both countries have built strategic trust over time to consider the transfer of approximately **11 critical technologies** in the **GE414 engine deal**.

*Challenges in India-US Relations- Russia and China*
**Challenges on Russia**
- Russian invasion of Ukraine has tested the **durability of the Ind-US Ties**.
- India has not criticised Russia's actions and this discomfiture of its allies in **Europe and the US.**
    - However, the Indian Prime Minister told the Russian President that "today's era is not of war".
- Also, the USA has shown an understanding of India's complex ties with Russia.
    - India is more than **60% dependent** on Russian defence supplies, and its purchase of **Russian oil at cheaper rates**.

**Challenges by China**
- Both India and US acknowledge China as the **biggest threat and rival**.
- India had seen the **threat from afar**, but US administrations had ignored the warning signs until Obama mentioned the term **"pivot."**
    - However, it was only during **Trump"s presidency** that the US unambiguously identified China as a **strategic threat**.
    - President Biden has maintained this framing.
- With the withdrawal of the United States from Afghanistan, China's stock in the region has risen after the withdrawal of the US from Afghanistan.

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- China's ambition and confidence to broker peace between the **Saudis and Iranians**, **Israel and Palestine**, and **Russia and Ukraine** have been noticed in the **US and India**.
- Because **Russia and China** have declared no-limits relations, India and the US have found reasons for **greater convergence** in approach.
  - The **Quad and I2U2 formats** are reflections of those.

**Other Challenges**
- Democrats have always been vocal about **human rights, press freedom, and minority rights**, whereas India has resisted interference in **"India"s internal affairs."**
- India has positioned itself as **a fellow democracy and a strategic counterweight** to China.

Indian Prime Minister's first state visit is hosted by the US President and First Lady, a lunch hosted jointly by the US's Vice President and Secretary of State, and a reception by top US Congress lawmakers. It will be a milestone in India's relationship with the US. This state visit is a visit in which there is a genuine and widespread deep interest in the United States.

## Uniform Civil Code In India: Uniformity Or Conformity?

**Uniform Civil Code (UCC)**
Uniform Civil Code is a proposal in India that is aimed at replacing personal laws based on religions, customs, and traditions with one common law for everyone irrespective of religion, cast, creed, sexual orientation, and gender.

**Is UCC part of the Indian Constitution?**
Yes, the Uniform Civil Code is mentioned in part 4th of the constitution which says the state "shall endeavour to secure for the citizens a uniform civil code throughout the territory of India". The framers of the Constitution envisioned that there would e a uniform set of laws that would replace primitive personal laws of every religion with regard to marriage, divorce, inheritance, and adoption. UCC is part of the Directive Principles of the State Policy which is not enforceable or justiciable in a court of law and are fundamental to the country"s governance.

**What is the Supreme Court saying about UCC?**
The Supreme Court in various judgments has called for the implementation of the UCC. In its Mohd. Ahmed Khan vs Shah Bano Begum judgment of 1985, where a divorced Muslim woman demanded maintenance from her former husband, the SC while deciding whether to give prevalence to the CrPc or the Muslim personal law, called for the implementation of the UCC.

The Court also called on the government to implement the UCC in the 1995 Sarla Mudgal judgment, and in the Paulo Coutinho vs Maria Luiza Valentina Pereira case (2019).

**What did the Law Commission say about UCC?**
In 2018, the Law Commission submitted a 185-page consultation paper on the reform of family law at the Modi government"s request. The Law Commission stated that UCC

"is neither necessary nor desirable at this stage", the report recommended that discriminatory practices, prejudices, and stereotypes within a particular religion and its personal laws should be studied and amended.

**How many Indian states have Uniform Civil Code?**

- Talking about the Uniform Civil Code, one cannot ignore Goa.
- The Goa Civil Code is in force since Portuguese times and is considered a Uniform Civil Code.
- In 1867, Portugal enacted a Portuguese civil code and in 1869 it was extended to Portugal's overseas provinces (that included Goa). However, it is quite complex on the ground.
- The Uttarakhand government on May 27 last year announced its decision to implement the Uniform Civil Code in the state.
- The State government constituted the five-member committee led by Desai, to prepare a draft proposal for implementation of the UCC.
- Uttarakhand Chief Minister Pushkar Singh Dhami has earlier said that the committee will submit its report by June 30 this year.
- Earlier, Assam Chief Minister Himanta Biswa Sarma underlined the need for the implementation of the Uniform Civil Code in the state and said that the introduction of the legislation is necessary to give justice to all Muslim women.
- The Gujarat government has also supported the implementation of the Uniform Civil Code.

**Benefits of UCC**

- *National Integration and Secularism:*
  - UCC would promote national integration and secularism **by creating a common identity and sense of belonging among all**
  - It would also **reduce the communal and sectarian conflicts that arise due to different personal laws.**
  - It would **uphold the constitutional values of equality, fraternity and dignity**for all.
- *Gender Justice and Equality:*
  - UCC would ensure gender justice and equality **by removing the discrimination and oppression faced by women**under various personal laws.
  - It would **grant equal rights and status to women in matters of marriage, divorce, inheritance, adoption, maintenance,**
  - It would also **empower women to challenge the patriarchal and regressive practices**that violate their **fundamental rights.**
- *Simplification and Rationalisation of the Legal System:*
  - UCC would simplify and rationalise the legal system **by removing the complexities and contradictions**of multiple personal laws.
  - It would**harmonise the civil and criminal laws by removing the anomalies and loopholes** that arise due to different personal laws.
  - It would **make the law more accessible and understandable** fo*r the common people.*
- *Modernisation and Reform of Outdated and Regressive Practices:*

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- UCC would modernise and reform the **outdated and regressive practices that are prevalent** in some personal laws.
- It would **eliminate the practices that are against the human rights** and values enshrined in the Constitution of India, **such as triple talaq, polygamy, child marriage, etc.**
- It would also **accommodate the changing social realities and aspirations** of the people.

## Cases Related to UCC

*Shah Bano Begum v. Mohammad Ahmed Khan (1985):*

The Supreme Court upheld the right of a Muslim woman to claim maintenance from her husband under Section 125 of the Criminal Procedure Code, even after the expiry of the Iddat period.

- It also **observed that a UCC would help in removing contradictions** based on ideologies.

*Sarla Mudgal v. Union of India (1995):*

- The Supreme Court held that a Hindu husband cannot convert to Islam and marry another woman without dissolving his first marriage.
- It also stated that a UCC would prevent such fraudulent conversions and bigamous marriages.

*Shayara Bano v. Union of India (2017):*

- The Supreme Court declared the practice of triple talaq as unconstitutional and violative of the dignity and equality of Muslim women.
- It also recommended that the **Parliament should enact a law to regulate Muslim marriages and divorces.**

## Challenges in Implementing UCC

- *Diverse Personal Laws and Customary Practices:*
  - India is a country of diverse religions, cultures and traditions.
    - Each community has its own set of personal laws and customs that govern their civil matters.
    - These laws and practices vary widely across regions, sects and groups.
  - To find a common ground and uniformity among such diversity is very difficult and complex.
  - Moreover, many **personal laws are not codified or documented,** but are based on **oral or written sources** that are **often ambiguous or contradictory.**
- *Resistance from Religious and Minority Groups:*
  - Many religious and **minority group''s view UCC as an infringement on their religious freedom** and cultural autonomy.
  - They fear that **UCC would impose a majoritarian or homogenous law** that would disregard their identity and diversity.
    - They also argue that **UCC would violate their constitutional rights under Article 25,** which guarantees the freedom of

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conscience and free profession, practice and propagation of religion.

- Lack of Political Will and Consensus:
    - There is a lack of political will and consensus among the government, the legislature, the judiciary and the civil society to initiate and implement UCC.
    - There are also apprehensions that **UCC could provoke communal tensions and conflicts**in the society.
- Practical Difficulties and Complexities:
    - UCC would require a **massive exercise of drafting, codifying, harmonising and rationalising**the various personal laws and practices in India.
    - It would **require a wide consultation and participation of various stakeholders**, including religious leaders, legal experts, women's organisations, etc.
    - It would also require a **robust mechanism of enforcement and awareness to ensure compliance**and acceptance of UCC by the people.

**Way Forward**
- *Unity and Uniformity:*
    - The recommended **UCC should reflect India"s multiculturalism and preserve its diversity.**
        - **Unity is more important than uniformity.**
    - The Indian Constitution **allows for both integrationist and restricted multicultural approaches**to accommodate cultural differences.
- *Discussion and Deliberations with Stakeholders:*
    - Also, involving a broad range of stakeholders, including religious leaders, legal experts, and community representatives, in the process of developing and implementing the UCC.
    - This could help to ensure that the UCC takes into account the diverse perspectives and needs of different groups, and that it is seen as fair and legitimate by all citizens.
- *Striking a Balance:*
    - The Law Commission **should aim to eliminate**only those practices **that do not meet** the constitutional standards.
    - **Cultural practices**must **align with substantive equality and gender justice goals.**
    - The Commission should avoid contributing to reactive culturalism among different communities.
    - The **Muslim clergy should lead the reform process**of Muslim Personal Law by identifying discriminatory and oppressive issues and considering progressive views.
- *Constitutional Perspective:*
    - The Indian Constitution upholds the right to cultural autonomy and aims for cultural accommodation.

- **Article 29(1) protects**the **distinctive culture** of all citizens.
- Muslims **need to question whether practices like polygamy and arbitrary unilateral divorce**align with their cultural values.
- The **focus should be on achieving a just code**that promotes equality and justice.

## Reforming Multilateral Development Banks, advocating for the Global South

- Multilateralism is recognized as the **most transparent and preferred** form of international cooperation and has continuously evolved in its **scope, dimensions, and outcomes**.
- The ongoing debate regarding the **reforms of multilateral development banks (MDBs)** is a subset of the broader discourse on the **value, content, and scope** of multilateralism.
- In recent years, there has been a growing focus on the **restructuring of MDBs**.
- Indian Prime Minister, in his address to the US Congress, highlighted the **significance of MDBs and the need for their reform.**

**Historical Background of Multilateral Development Banks (MDBs)**

- At the end of WWII, delegates from 44 countries met in Bretton Woods to agree upon a series of new rules for **international cooperation and reconstruction**.
- This led to the creation of the **IMF and World Bank Group (WBG).**
- The latter was responsible for providing financial **assistance for the less developed countries** post-war reconstruction and economic development.
- The role evolved over the years and as of date, the WBG comprises-
    - **International Bank for Reconstruction and Development (IBRD)** which lends to low-and middle-income (LICs and MICs) countries,
    - **International Development Association (IDA)** that lends to LICs, the International Finance Corporation (IFC) lends to the private sector,
    - **Multilateral Investment Guarantee Agency (MIGA)** that encourages private companies to invest in foreign countries and
    - **International Centre for Settlement of Investment Disputes (ICSID)** for dispute settlement.
- While the WBG is the **oldest and largest MDB, several other MDBs and regional development banks (RDBs)** have emerged over the years.
- Today, there are about **15-16 prominent MDBs and RDBs**.

**Challenges Faced by MDBs**

- Over the years, despite significant **geopolitical changes, economic crises, and uncertainties**, MDBs have remained relevant as reputable institutions for supporting the development of both MICs and LICs.
- However, it is widely believed that these institutions are **no longer suitable** in terms of **resources, cultural ethos, and methods** to address emerging challenges.

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- These challenges pertain to **global public goods, climate change, and pandemics**.
- Many believe that MDBs are currently in a difficult situation, constrained by their **procedures, approach, and working methods**, and **hesitant** to undergo structural changes.
- Considering their **technical knowledge, experience, and credibility** in the financial sphere, MDBs need to **redefine their role and methods**.
- The two longstanding objectives shared by all multilateral institutions have been the **eradication of poverty** and the **promotion of inclusive prosperity**.

### Broadening the Mandate

- The new challenge is to expand the **mandate and vision** to address the issues of **transboundary concerns** and the opportunities associated with **climate change**.
- Each of these **four aspects** requires different financing methods and approaches to work.
- It is crucial to acknowledge that the goals of **poverty eradication** and **shared prosperity** have proven to be elusive.
- Furthermore, **shared prosperity** has worsened both **within and between countries** in recent times.

### Financing Challenges

- Issues lie in the challenge of aligning the **financing capacity of MDBs** with the broader goals while ensuring that **development financing** is not compromised.
- Setting aside the **impact of the pandemic**, the average annual lending commitments from MDBs to developing countries amounted to approximately **$120-130 billion.**
- According to the World Bank Group (WBG), addressing global challenges such as **climate change, conflict, and pandemics** will require an estimated average annual expenditure of **$2.4 trillion** for developing countries between **2023 and 2030**.
- Additionally, a report on climate finance emphasizes the need for a significant breakthrough in mobilizing **$1 trillion per year** in external finance by 2030 for **emerging markets** and **developing countries** (excluding China).

### Ensuring Sustainable Finance for Development

- While it is essential to broaden the mandate of MDBs, it should not come at the expense of available funding for traditional priorities, such as addressing poverty and inequality.
- These issues remain significant concerns in LICs and EMDCs, including India.
- In this context, the Expert Group is exploring various options to ensure that **concessional finance** targeted towards LICs is not compromised.
- MDBs need to optimize their **current balance sheets** to generate greater leverage from **existing funds** and **attract private capital**.
- Establishing **annual targets** and **evaluating performance** based on outcomes achieved within this revised framework of accountability is crucial.

### Need for Enhancing Recapitalization

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- As for the IBRD, the paid-in capital currently amounts to just over **$20 billion**, against which it has successfully conducted lending operations **exceeding $800 billion.**
- In 2022, the WBG provided loans of **$428 billion** with equity (paid-in capital and retained earnings) amounting to **$267 billion.**
- In 2022, the Asian Development Bank granted loans of **$144 billion** with an equity capital of **$54 billion**.
- The need for **enhancing recapitalization** arises from the principle that despite harnessing resources for balance sheet optimization and attracting private capital, there will still be a requirement to **recapitalize the banks.**
- It is also worth noting that the **IBRD** operates without a **replenishment cycle**, which is somewhat unusual.
- Additionally, other multilateral institutions have effectively leveraged their relatively **modest capitalization.**

## Mobilizing Private Capital

- There is a need to **mobilize private capital.**
- The current system has not been successful in **raising sufficient private finance**.
- On the demand side, there are concerns about **moral hazards** associated with private capital.
- On the supply side, private capital is exposed to risks, including those related to **foreign exchange**.
- Consequently, many projects fail to progress due to either **high risk or low returns**.
- De-risking approaches, such as **blended finance and guarantees**, aim to rebalance the situation.
  - However, these approaches often require increased **reliance on public and donor support.**
- Concerns about using public resources to unlock private-sector investments inevitably arise.
- Therefore, it is crucial to **strengthen financial channels** for capital mobilization.

## *MDBs" Coordination, Collaboration, and Advocacy for the Global South*
## Coordination and Collaboration among MDBs

- There is also a need to develop an **incentive structure** and make **changes to the MDBs"** current operating model.
- MDBs must closely **work together** with each other.
- To significantly improve **performance, broad and deep changes** are required, such as first-**loss guarantees, realistic return targets, and risk management**.

## Advocating the Voice of the Global South

- Reforming the MDBs in the context of India involves advocating for the representation and interests of the **Global South**.
- This endeavour aims to bring coherence to a diverse array of initiatives and endeavours aimed at **strengthening the MDBs.**

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- The Expert Group tasked with this mission takes a **comprehensive approach**, considering a broad range of issues and outlining a **practical and feasible program**.
- The Expert Group intends to present two reports, each addressing different aspects.
  - The first report focuses on matters concerning **vision, financial capacity, and funding modalities** for the MDBs.
  - The second report tackles issues related to **mobilizing private capital, managing risks, effectively utilizing guarantees** to leverage private investment, and exploring innovative financing models.

Making MDBs more relevant for addressing 21st-century challenges would significantly contribute to the enhancement of human welfare. It is of utmost importance to establish deeper integration with multiple stakeholders, as their active involvement holds the key to success. Should MDBs fail to effectively respond to these emerging challenges, their relevance will gradually diminish, and alternative forms of collaboration will likely take their place. Hence, it is imperative to take agile action to ensure the vitality and resilience of MDBs in this ever-evolving landscape

## India's FDI and Manufacturing Challenge

**Manufacturing Sector**
- Manufacturing is the process of turning raw materials or parts into finished goods through the use of tools, human labour, machinery, and chemical processing.
- The manufacturing sector is part of the goods-producing industries supersector group.
- Among the most important manufacturing industries are those that produce aircraft, automobiles, chemicals, clothing, computers, consumer electronics, electrical equipment, furniture, heavy machinery, refined petroleum products, ships, and steel etc.

**India's Manufacturing Sector at a Glance**
- Economic contribution: Currently, manufacturing accounts for about 15 percent of the country's GDP.
- Global share: India is the sixth-largest manufacturing economy in the world and contributes 3.1% to the world GDP.
- Employment: Manufacturing sector in India employs about 12% of the total labour force. Overall, more than 30 million people are employed in the sector (organised and unorganised).
- Capacity utilisation: In the second quarter of FY22, capacity utilisation in India's manufacturing sector stood at 72.0%, indicating significant recovery in the sector.
- It is measured by the Reserve Bank of India (RBI). It indicates not only the production levels of companies but also the potential for future investment.

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- Share in exports: Manufactured goods consists of almost 65% of Indian merchandise exports or around 43% of total exports. Manufacturing exports saw a CAGR of more than 15 per cent to touch $418 billion in fiscal year 2021-22.
- FDI Share: 35% of all FDI inflow. India is rapidly emerging as a preferred country for foreign investments in the manufacturing sector.

**Economic Reforms 1991**

- The reforms brought significant reductions in tariffs and the removal of bureaucratic barriers but did not result in a substantial increase in the share of manufacturing in the overall economy.
- However, there has been a qualitative change in the sector since 1991, with an impressive increase in the range and quality of products manufactured in the country.
- The rising quality and variety of goods being produced without a proportional growth in the manufacturing sector's share of the economy may indicate a concentration of wealth and income among a smaller segment of the population.
- Gaps in Development of Manufacturing Sector:
- There has been a significant gap in attention to the manufacturing sector in India following the economic reforms of 1991.
- The government's focus on manufacturing reemerged in 2014 with the launch of the "Make in India" initiative, which emphasised attracting foreign direct investment (FDI).
- Additionally, the more recent Production-Linked Incentive (PLI) scheme was introduced to subsidise production in specific sectors.
- However, despite the initial enthusiasm and high-profile announcements, the performance and outcomes of these initiatives have been underwhelming or disappointing.

**Low Manufacturing Growth and Structural Issues**

- According to the first advance estimates of the national income for the fiscal year 2022-23 in India, the manufacturing sector has recorded a growth rate of 1.3% which is lower than the growth rates observed in agriculture and various segments of the services sector.
- The data provide clear evidence of the impact of the demonetization policy implemented in 2016, which contributed to the slowdown of the manufacturing sector. Demonetization refers to the government's decision to invalidate certain currency notes as a measure to combat corruption and black money.
- Despite the implementation of policy initiatives specifically targeting the manufacturing sector, it continues to experience consistently low growth rates in India. This implies that there are underlying structural issues or factors hindering its growth and development.

**The Demand Side Problem**

- While the government has taken measures to improve the supply side of the manufacturing sector, it is equally important to address the demand side.
- The focus on improving infrastructure, policy initiatives, and lowering taxes has primarily targeted enhancing the supply capacity and competitiveness of the manufacturing sector.

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- Household demand for manufactured goods is closely tied to the satisfaction of basic needs such as food, housing, health, and education, which cannot be postponed.
- In India, a significant portion of household expenditure is allocated to food, which constrains the growth of demand for manufactured goods.
- There is a strong negative relationship globally between per capita income and the share of food in household expenditure. Wealthier countries like the United States and Singapore have lower shares of expenditure on food.
- In contrast, India has a relatively higher share of food expenditure and a lower GDP per capita. This indicates that the demand for manufactured goods may be limited by the large share of expenditure dedicated to food in India.
- Therefore, focus should be on stimulating demand by involving measures to improve income levels, enhance access to basic necessities, and promote economic stability and social welfare.

## The Export solution

- While industry leaders have no direct control over the demand side of the equation, the possibility of exporting can help the manufacturing sector overcome limitations of the domestic market.
- Comparisons with East Asian economies show that successful exporting requires infrastructure and a skilled workforce. Infrastructure affects production costs, while the skill level of the workforce determines the type of products a country can produce.
- Additionally, factors like inexpensive power, available space, and proper industrial waste disposal services are important considerations for competitiveness in the manufacturing sector.

## Problems in the Education system

- India's performance in international assessments like the Programme for International Student Assessment (PISA) ranks comparatively low among around 75 countries, while the countries of East Asia excel in these assessments.
- Also the leading Indian employers have expressed concerns about the lack of employability of university graduates, even from prestigious institutions like the Indian Institute of Technology.
- While India's universities have expanded to cater to the aspirations of the middle class, there has been a neglect of vocational training institutes and the development of skills necessary for various skilled trades such as carpentry, plumbing, and mechanics.
- Also, the former Planning Commission data showed that only about 5% of Indian youth had received any form of technical training, in contrast to South Korea's figure of over 85%. This highlights the stark difference in the preparedness of the labour force for manufacturing-related jobs between India and countries like South Korea.
- This lack of adequate skills and education among the labour force poses a challenge for India to make a mark on the global stage for manufacturing. Addressing these education and skill gaps becomes crucial for the long-term success and competitiveness of India's manufacturing sector.

## Services Sector

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- Also known as the tertiary sector, is the third tier in the three-sector economy.
- The service sector is the largest sector of the global economy in terms of value-added and is especially important in more advanced economies.
- India's services sector covers a wide variety of activities such as trade, hotel and restaurants, transport, storage and communication, financing, insurance, real estate, business services, community, social and personal services, and services associated with construction.

## India's Services Sector at a glance

- Economic contribution: Services sector in India continues to outperform agriculture and industrial sector growth, contributing around 55% of GDP.
- Global share: India is among the top 10 service exporter countries in 2020 having a 4.1% share in world commercial service exports.
- Employment: Services sector in India employs about 25% of the total labour force.
- Share of exports: Service exports contribute to around 40% of total exports. Computer, business and transportation services constitute more than 80 per cent of total services exports.
- FDI share: Services sector is the largest recipient of FDI inflows in India, accounting for almost 54 per cent of the total FDI inflows into India.

The debate of manufacturing v/s services in India

## Arguments in favour of manufacturing sector

- High employment potential: Manufacturing can create a high number of direct and indirect jobs, while the growth of employment in agriculture is slow and declining, manufacturing offers the best opportunity for the workforce to shift away from agriculture.
- Availability of workforce: Manufacturing sector in India has the potential to become the engine of growth as it tries to incorporate the huge available workforce in India, most of whom are semi-skilled.
- Rural development: The sector will push growth in the rural areas where more than 5 million manufacturing establishments are running already. This will be an alternative available to the new generation of farmers.
- Growth potential: Recently, India emerged as the world's second-most attractive manufacturing hub. The manufacturing sector of India has the potential to reach US$ 1 trillion by 2025.
- Competitive advantage: Increasing share of young working population (demographic dividend) and there has been immense policy support through initiatives such as Make in India, Production Linked Initiative (PLI) scheme and Skill India Initiative etc.
- Problems with the service-led growth:
- Skewed employment generation: Though the services sector's contribution is over 55% of GDP, it has not been able to create enough jobs in a commensurate manner.
- External dependence: Our growth in the services sector is mainly linked with the export of skill-based services, which are dependent upon external demand, thus unsustainable in the long-run.
- Non-uniformity: Growth pattern in the services sector has not been uniform across all services in India. For example, software and telecommunication

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services have grown much rapidly, while education and health services have witnessed slow pace.

- Limited potential: The service has limited potential to export or achieve economies of scale, and thus unable to benefit from expanding global trade
- Spillover effect: Manufacturing sector has high forward and backward linkages and has a positive spillover effect on services growth. Therefore, targeted policy attention to manufacturing is necessary.

**Arguments in favour of services sector**

- Attractive ecosystem: Government initiatives such as 'Digital India', 'Startup India', fast growing technology infrastructure and well developed financial market make the Indian services sector an attractive ecosystem for both the entrepreneurs and the investors.
- Digital talent: India is the digital capabilities hub of the world with the presence of 75% of global digital talent.
- Competitive advantage: Large pool of skilled manpower, especially in the areas of IT & BPM available at a relatively low cost and a rapidly increasing youth population looking to migrate from agriculture to other sectors.
- Niche features of the sector: Features of the services sector such as low setup costs, no requirement of inventory logistics, flexible working hours and great adaptability to changes makes the sector an attractive investment destination.