

# **MONTHLY** **CURRENT AFFAIRS** **JANUARY-FEBURARY 2023** **for Competitive Exams**

**The Complete Coverage of All Important  
Events from January - February 2023**



## **HIGHLIGHTS**

- ▶ JOSHIMATH CRISIS
- ▶ SKYGLOW: LIGHT POLLUTION
- ▶ KEN BETWA LINK PROJECT
- ▶ INDIA CHINA TRADE DEFICIT
- ▶ STATUS OF RUBELLA AND MEASLES IN INDIA
- ▶ ISRO SETTING BACK THE "SHUKRAYAAN" VENUS MISSION TO 2031



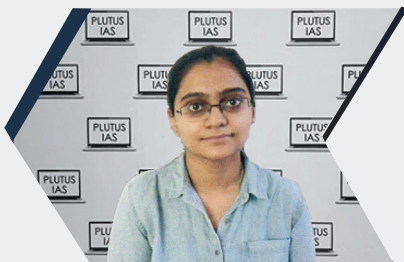
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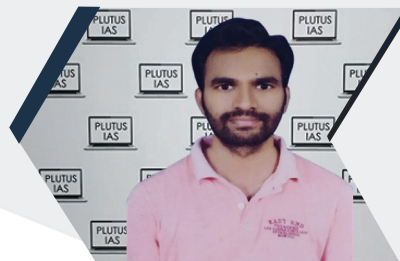
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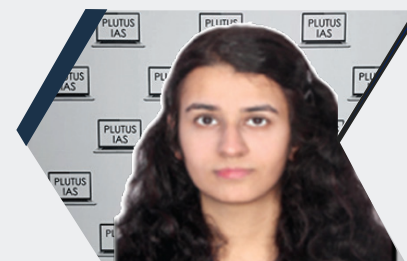
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Many more...

# Foreword

**Dear Aspirants,**

This magazine by **Plutus IAS team** is designed in such a fashion that it holistically covers all the relevant and important topics for civil services exam or IAS exam to make aspirants battle or exam ready. **Plutus IAS Current Affairs Magazine** is a secondary source of information, the newspaper will always remain the first source for preparation of current affairs.

Now, current affairs no longer remain the current, it is contemporary affairs. Questions asked in prelims as well as mains test the conceptual clarity of an aspirant. This magazine prepared with an aim to help you understand the interlinkage of both statics and current and internalize those concepts required to crack this examination.

**Plutus IAS team** wishes you all the best. Prepare for UPSC Civil Services Examination with calm, composed and serene mind with some patience to crack this examination in one go.

Team  
Plutus IAS

## Sources:

The Hindu | The Indian Express | The Economic Times | Press Information Bureau (keep checking the Features section for imp articles and our weekly PIB Gist) | PRS (only for recent Bills and articles related to them) | IDSA: Institute for Defense Studies and Analysis (keep checking every 2-3 days for in-depth IR articles) | Yojana and Kurukshetra (no need to read all articles – read selectively) | Lok Sabha and Rajya Sabha Debates | NCERTs All standard reference books.

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# JANUARY - FEBRUARY 2023

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# **General studies - 1**

(Indian Heritage and Culture, History and Geography  
of the World and Society)

# HYPER-GLOBALIZATION

## HYPER-GLOBALIZATION AND THE EFFECT OF IT ON INDIA

This article covers “Daily current events “and the topic is ‘Hyper-Globalization’ Which is in news, it covers the “impact of it on Indian Society” In GS-1, and the following content has relevance for UPSC.

**FOR PRELIMS:** About hyper-globalization

**FOR MAINS:** GS -1, about hyper-globalization and its impact

### WHY IN NEWS:

- In 2022, two wars are actively taking place, undermining hyper-globalization.
- The first conflict is Russia’s invasion of Ukraine, while the second conflict is an economic conflict between two superpowers (US and China).
- The global trading order suffers the most collateral damage from the two conflicts: instead of production based on comparative advantage and trade profits, it is now each nation for itself.

### ABOUT HYPER-GLOBALIZATION

- It is the abrupt increase in the size, reach, and speed of globalization that started in the late 1990s and has persisted throughout the first decade of the twenty-first century.
- Political, cultural, and economic globalization are all three of their key facets are all covered.

### SALIENT FEATURES

- Characteristics of a hyper-globalized world: Wars are not common, and economies mostly adhere to the theories advanced by Adam Smith and David Ricardo in the late 18th and early 19th centuries.
- In his book “Wealth of Nations,” Adam Smith argued that we should purchase a good from a foreign nation if they can do it at a lower price than we can.
- According to Ricardo, nations are capable of producing even goods in which they do not have an “absolute advantage.” Comparative advantage was important.
- The concept of comparative advantage served as the driving force behind “hyper-globalization’s” second golden age.

- The “doux commerce” premise holds that men become less likely to engage in violence or illogical behavior as a result of trade.
- “Commerce is a remedy for the most harmful prejudices,” according to the French philosopher Montesquieu, and “peace is the natural outcome of the trade.”

### **COMPARING GLOBALIZATION AND HYPER-GLOBALIZATION**

- The International Monetary Fund describes globalization as the process by which international commerce and financial markets are uniting.
- Hyper-globalization is the term used to characterize the tremendous rise in global trade that has been observed for nearly 15 years, starting in the early 1990s. It caused a previously unheard-of movement of both capital and people.
- The primary distinction is how quickly the globalization process proceeds.

### **THE EFFECTS OF IT ON INDIAN SOCIETY**

- It encouraged manufacturing in India based on comparative advantage.
- For semiconductor companies producing less complex 28-65 nm range semiconductors that can be utilized in autos, household appliances, and mobile phones, India is offering incentives totaling 30-50% of the project cost.
- Five years ago, it might not have thought it was worthwhile to spend tax dollars on this.



# EPIGRAPHY

Here, The topic “Epigraphy” reflects Indian History and Culture. The article also talks about the reconstruction of ancient Indian History.

**RELEVANCE FOR PRELIMS:** Asokan Era

**RELEVANCE FOR MAINS:** Relevance and significance of Epigraphy

Epigraphy is the study of inscriptions that are engraved on stone tablets, metal plates, pillars, walls of caves, etc. It serves as primary documentary evidence to establish legal, socio-cultural, literary, religious, archaeological, and historical antiquity based on engravings. On the other hand, Numismatics refers to the study or collection of coins, paper money, and related objects. It gives information about the economic situation, administrative structure, chronological issues, the extent of influence of a particular kingdom, and its relations with distant areas. Epigraphy helped in the Reconstruction of Ancient Indian History

## **SOME EXAMPLES OF HOW EPIGRAPHY HAS HELPED IN THE RECONSTRUCTION OF ANCIENT INDIAN HISTORY ARE**

- The edicts of Asoka, the pillars of Samudragupta and Rudradaman-I are
- Religious and administrative inscriptions that throw light on the cultural mission
- And the administrative maneuverin of the period.
- Inscriptions also throw light on the existing social customs. For example, the
- Brahmadeyam inscription refers to the sati committed by the queen of Rajendra Chola I.
- The Mandatory copper plates, the Sohgaura plate from Gorakhpur district, the
- Aihole inscription of Mahendra-Varman and the Uttiramerur inscriptions of Cholas cast light on trade, taxes, and currency
- Inscription from Jogimara cave depicts the prevalence of the tradition of dance and music.
- Epigraphy throws light on the boundaries of kingdoms and empires, the life lived in the past, the nature of society and economy, and the general state of life.

## **NUMISMATICS HELPED IN THE RECONSTRUCTION OF ANCIENT INDIAN HISTORY NUMISMATICS HAS ALSO HELPED IN THE RECONSTRUCTION OF HISTORY IN THE FOLLOWING WAYS**

Roman coins discovered in India give us an idea about the existence of contacts with the Roman Empire. Portraits and figures, Hellenistic art, and dates on the coins of the western satraps of Saurashtra are remarkable sources for reconstructing this period.

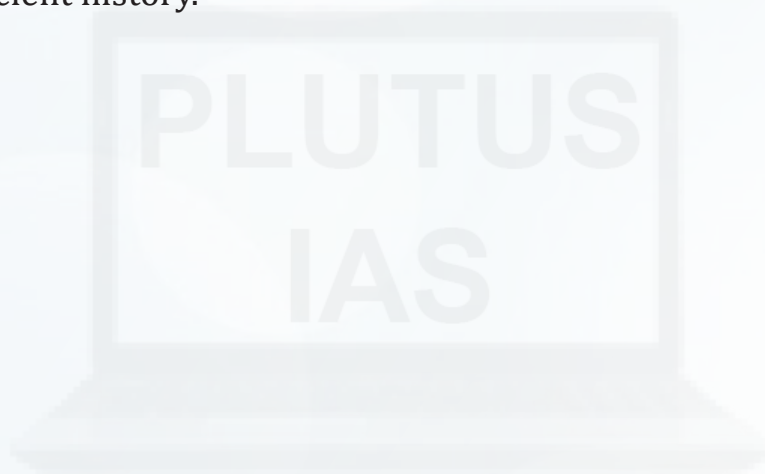
The Puranic accounts of the Satavahanas are ascertained from the Jogalthambi hoard of coins. Administration under the Sakas and the Pallavas has been reconstructed largely on the basis of coins.

Kharoshti and Brahmi scripts were deciphered with the help of coinage of the Kushan Era.

The purity of gold and silver coins imparts an idea of the economic condition during the rule of the Guptas. The entire argument for instance on the urban decay rests on the paucity of currency and lesser content of precious metals in coins in that period.

## **CONCLUSION**

Thus, epigraphic and numismatic evidence is one of the most reliable sources for reconstructing ancient history.



# **General Studies - 2**

(Governance, Constitution, Polity, Social Justice & International Relations)

# Role of Civil Services in Democracy

## ROLE OF CIVIL SERVICES IN DEMOCRACY IN INDIA

Civil Services form the foundation of the government which provides strong support to maintain the structural integrity of the nation. Hence, Vallabh Bhai Patel has rightly said, that Civil Services is the steel cage of India. However, the services are marred with criticism which is equivalent to rusting of the steel cages. The article talks about how the Role of Civil Services in Democracy impacts Indian Polity and Governance.

## ROLE OF CIVIL SERVICES IN DEMOCRACY

**Welfare services:** Civil servants provide welfare services for the people including social security, the welfare of weaker sections, and the enhancement of environmental quality.

**Maintain continuity in administration:** Government comes and goes, ministers rise and fall, and administration run by civil servants goes on forever.

**Law and Order:** They maintain law and order by enforcing laws in an adequate manner. The enforcement of laws depends upon the dedication of civil servants.

## ISSUES ASSOCIATED WITH CIVIL SERVICES

**Transparency and Accountability:** Lack of oversight mechanism allows civil servants to indulge in corrupt practices with impunity which leads to a loss of public faith in the administration.

**Secrecy:** There is a culture of discreetness than openness where civil servants are hesitant in collaborative governance.

**Lack of Dynamism:** Officers are more concerned with internal processes than results. Often, it has been pointed out that rapid changes are taking place in nations in the context of laws, economy, and technology but the response time is much shorter.

**Political intervention:** Unincreased frequency of political intervention to further political agenda has made services regressive.

**Timely skilling and upgradation of personnel is the need of the hour.** Mission Karmayogi has been brought to enhance governance and develop domain knowledge besides administrative capacity in bureaucracy. The new program could reverse the rusting of steel cages in India.

## Regionalism and Separatism in India

The topic talks about how Regionalism and Separatism in India impact Indian Polity and Governance.

**RELEVANCE FOR PRELIMS:** Special category Status

**RELEVANCE FOR MAINS:** Regionalism, Causes and consequences of Regionalism

### WHY IN NEWS?

Context: Recent Survey has suggested that in many northeast states, regional tendencies have grown over time due to a lack of infrastructure and development projects in the region.

Regionalism is an emotional attachment to a region/identity/culture/language. Example- In India, many people consider themselves as Punjabi, Maharashtrian, or Tamilian more than an identity of an Indian.

### FACTORS ATTRIBUTED TO DEMAND FOR SEPARATISM AND REGIONALISM IN INDIA

**Unbalanced Development:** Many states have passed job reservation laws to secure employment for natives which create division between outsiders and locals. Example: Discrimination with Bihar natives in Gujarat and Jammu and Kashmir, Threats to North-East in Bangalore.

**Religious Factors:** The demand of Khalistan was based upon the creation of a state on the basis of Religion.

**Political Factors:** Owing to the diversity of India, many national parties are not able to get a stronghold in southern states which led to the rise of regional parties which gave them a unique identity of having a leader of their own. Example: Trinamool Congress, AIDMK

**Linguistic:** The mother tongue of an individual develops an identity of belongingness. The creation of linguistic states has been one of the first challenges faced by the government to accommodate diversity. Example: Andhra Pradesh, Telangana.



## REGIONALISM IN INDIA



### Separatism and Regionalism in India

#### MEASURES NEEDED

Cultural awareness and sensitization must become a part of the curriculum to avoid hatred based on region and language.

Fairs, Festivals should be conducted on a national scale to promote uniformity and integration.

Development projects and policies should be inclusive and crafted according to the needs of the region.

Schemes like “Ek Bharat Shreshta Bharat” is the need of the hour which not only celebrate diversity in unity but strengthen the sentiments of the state and citizens.

## High Powered Committee on Ladakh

*This article covers “Daily current events” and the topic is about the ‘High powered committee on Ladakh’ which is in news, it covers “Polity and Governance” In GS-1 and GS-2, and the following content has relevance for UPSC.*

**FOR PRELIMS:** 6th schedule, Ladakh Autonomous Hill District Councils of Leh and Kargil, Geography of Ladakh

**FOR MAINS:** About High powered committee on Ladakh

### WHY IN NEWS:

Recently, the Ministry of Home Affairs established a powerful committee to talk about ways to safeguard the “ensure the protection of land and jobs” for the people of Ladakh.

### ABOUT HIGH POWERED COMMITTEE ON LADAKH

- The committee, which will have 17 members, will be led by the state minister for home affairs. Among its members are :
  - The chairmen of the autonomous hill councils of Leh and Kargil,
  - MHA's joint secretary for Ladakh affairs,
  - MP for the area, and
  - Ladakh Lieutenant Governor.
- The committee was established by the directive to talk about ways to safeguard the region's distinctive language and culture while taking into account both its strategic and geographical value.
- The group will also talk about ways to secure land rights and create jobs for Ladakh residents, as well as how to empower the Ladakh Autonomous Hill Development Council in Leh and Kargil while fostering inclusive growth and job creation.

### THE REASON WHY WAS A COMMITTEE FORMED

- The protection of land, resources, and jobs have been demanded by civil society organizations in this region for the previous three years, following the reading down by Parliament on August 5, 2019, of the special status of the formerly-existing State of Jammu and Kashmir under Article 370 of the Constitution.
- The committee will discuss ways to safeguard the region's distinctive culture and language while taking into account its strategic importance.

- Further geographic location, protect the land and jobs of the people of Ladakh, plan for inclusive development, and talk about matters about the empowerment of the Ladakh Autonomous Hill District Councils of Leh and Kargil.

### **ABOUT THE SIXTH SCHEDULE**

- By establishing autonomous development councils that can draught legislation on land, public health, and agriculture, the sixth schedule of Article 244 of the Constitution safeguards the autonomy of tribal populations.
- Ten autonomous councils are currently operating in Assam, Meghalaya, Tripura, and Mizoram.
- Ladakh has a total population of 2,74,289, with close to 80% of them being tribals, according to the 2011 Census.

### **GOVERNMENT'S STAND**

- Recently, the MHA explained to a parliamentary standing committee that it is not attempting to award Ladakh any special status.
- The inclusion of tribal groups under the sixth schedule is meant to ensure their general socioeconomic development.
- The UT administration has already been ensuring, and that it is receiving sufficient funding to meet its overall developmental needs.
- The administration has enhanced the reservation for the Scheduled Tribes in direct recruitment from 10% to 45%, which will considerably aid the tribal community in their development.

### **ABOUT LADAKH**

- The northernmost region of India is called Ladakh, and it borders Tibet to the east, Gilgit-Baltistan to the west, Jammu and Kashmir to the south, and the Indian states of Himachal Pradesh and Himachal Pradesh to the south.
- It reaches down to the Great Himalayas in the south, from the Siachen Glacier in the northern Karakoram range.
- It's India's only Cold desert.
- It, also known as Bhoti or Bodhi, is home to the Tibetic Ladakhi language, which is also known as the Tibetan language.
- Goucha, or Kuntop & Bok in the local language, is the name of the long woolen robe worn by Ladakh's males. Kuntop & Bok are the names of the corresponding robes

worn by women. Long hats are called peraks and are worn by both men and women.

- Instruments used in traditional music include the linyu flute, damnyan stringed instrument, pivang, khakong sitar, daph (dafli) daman, surna, and piwang (shehnai and drum).
- Dance: The Khatok Chenmo, which is directed by a devout family member named Shondol, is one of the well-known dances in Ladakh.
- Other dancing styles include Alley Yaato, Kompa Tsum-tsak Jabro Chaams, Chabs-Sk-yan Tses, and Raldi Tses. Chham, or mask dances, which frequently depict the triumph of good over evil, is one of the most well-known dance styles in Ladakh.
- Social Structure: In comparison to other regions of India, Ladakh accords women in a relatively high position. As soon as the eldest son marries, the elders of a family retire from daily engagement in household matters. This practice is called “Khang-bu,” or “small house.”





# Jallikattu

## JALLIKATTU AND ITS EFFECT ON INDIAN POLITY AND GOVERNANCE-CONSTITUTION

This article covers “Daily current events “and the topic is about ‘Jallikattu’ which is in news, it covers “Polity and Governance” In GS-1 and GS-2, and the following content has relevance for UPSC.

**FOR PRELIMS:** Article 29, Article 48, the Prevention of Cruelty to Animals (Tamil Nadu Amendment) Act of 2017, and the Prevention of Cruelty to Animals (Conduct of Jallikattu) Rules of 2017.

**FOR MAINS:** Socio-political issues regarding jallikattu

### WHY IN NEWS:

A five-member Constitution Bench of the Court will soon rule on a number of petitions that sought to overturn a 2017 law that protected the bull-racing practice known as Jallikattu in Tamil Nadu.

### ABOUT JALLIKATTU

- Jallikattu is a more than 2,000-year-old custom that is both a competitive sport and a celebration of bull owners who raise their animals for mating.
- The bull owner gets the prize if the contenders are unsuccessful in taming the bull. It is a brutal sport.
- As CulturalSports: The “Jallikattu belt” in Tamil Nadu’s Madurai, Tiruchirappalli, Theni, Pudukkottai, and Dindigul districts is where it is most popular.
- Time and event: It is observed during the Tamil harvest festival of Pongal, which falls in the second week of January.
- Importance in Tamil Culture: It is seen as a customary means by which the peasant community protects their native bulls of pure ancestry.
- Conservationists and peasants contend that Jallikattu is a way to safeguard these male bulls that are otherwise utilized only for meat, if not for ploughing, at a time when cattle breeding is frequently an artificial procedure.

### JUDICIAL INTERVENTION ON JALLIKATTU

- Interventions by the law on this issue: In 2011, the Centre added bulls to the list of animals whose training and exhibition are forbidden.



- In response to a petition that cited the 2011 warning, the Supreme Court outlawed the sport of bull-taming in 2014.

### **WHEN DID THE PRESENT DISPUTE BEGIN?**

Jallikattu was outlawed by the Supreme Court in a decision in the Animal Welfare Board of India v. A. Nagaraja case in May 2014.

The Prevention of Cruelty to Animals (Tamil Nadu Amendment) Ordinance 2017 was brought up by the protesters.

In February 2018, the Court was moved after the Assembly approved a Bill to replace the Ordinance, and the case was then sent to the Constitution Bench.

### **ISSUES TO BE ADDRESSED**

The issue regarding whether It should be protected by the Constitution as a collective cultural right under Article 29 (1),

A fundamental right is given by Part III of the Constitution to safeguard citizens' rights to education and culture.

The Prevention of Cruelty to Animals (Tamil Nadu Amendment) Act of 2017 and the Prevention of Cruelty to Animals (Conduct of Jallikattu) Rules of 2017 were subject to scrutiny by the court.

to determine whether they “perpetuate cruelty to animals” or rather serve to protect “the survival and well-being of the native breed of bulls.”

### **SUPREME COURT’S STAND:**

The Tamil Nadu Regulation of Jallikattu Act, 2009, which had permitted Jallikattu, was overturned by the court in 2014,

the Court had mentioned how bulls were “tortured to the hilt” while doing performances on the occasion.

The Supreme court then considered whether the new legislation was “related” to Article 48 of the Constitution, which commanded the government to make an effort to organize agriculture and animal husbandry along contemporary and scientific lines.

The Prevention of Cruelty to Animals Act of 1960’s goal of “prevention” of animal cruelty was another question the Constitution Bench considered in relation to the legislation of Karnataka and Maharashtra regarding this issue and bullock-cart races.

## THE OVERALL ANALYSIS OF THE ISSUE

### AGAINST:

**Problem with the game:** The Animal Welfare Board of India's inquiry revealed that "Jallikattu is intrinsically harsh to animals."

**Human fatalities:** A number of people have been killed or injured as a result of the incident, and there have also been multiple bull deaths.

**Animal abuse:** Bull handling before release as well as during the competitor's efforts to control the bull raises questions about animal welfare.

**Animal cruelty:** Before the bull is let out, practices including probing it with pointed objects like sticks or scythes, severely twisting its tail so hard that it could fracture its vertebrae, and biting its tail are used.

**Animal intoxication:** There are other instances of bulls being made to drink alcohol to make them dizzy or being given hot peppers rubbed in their eyes to make them angry.

### FOR:

- Native breed conservation: According to its proponents, it is not a pastime for leisure but rather a way to support and protect the local cattle.
- Sangam scriptures mention Jallikattu, which was known to be practiced between 400 and 100 BCE during the Tamil classical period.
- Some people think the sport also represents the friendly interaction between humans and animals.
- Position in Other States for Comparable Sports: Kambala, a similar sport, was saved by a statute established in Karnataka.
- Bull-taming and racing are still prohibited in all other states, including Andhra Pradesh, Punjab, and Maharashtra, thanks to the Supreme Court's 2014 ban order, with the exception of Tamil Nadu and Karnataka, where they are still organized.

## State Council of Ministers

*This article covers "Daily current events" and the topic is about "The state council of ministers" which is in news, it covers the "Indian polity" In GS-2, and the following content has relevance for UPSC.*

**FOR PRELIMS:** Federalism, Separation of power

**FOR MAINS:** GS-2, Indian polity

### **WHY IN NEWS:**

In addition to appointing six legislators as Chief Parliamentary Secretaries, Himachal Pradesh's Chief Minister increased the size of his cabinet by adding seven MLAs as ministers (CPS).

### **CONSTITUTIONAL PROVISIONS OF THE STATE COUNCIL MINISTERS**

- Part VI of the Constitution deals with the States or the second half of Indian federalism.
- Articles 152-237 cover a variety of state-related rules. It includes the state's legislative, judicial, and executive bodies.
- Articles 163–164 of the Constitution of States deal with the Council of Ministers (CoM).
- According to Article 163, the Council of Ministers assists and advises the Governor. Similar to central ministerial councils are state councils of ministers.
- The state council is under the direction of the Chief Minister. The governor appoints ministers to the council on the counsel of the CM.

### **ADDITIONALLY, AS STATED IN ARTICLE 163 OF THE CONSTITUTION:**

- The Governor is assisted and advised in carrying out his duties by a Council of Ministers, headed by the Chief Minister unless the Governor is required by or according to this Constitution to exercise all or any of his duties at his discretion.
- The Governor's decision in his discretion shall be final, and the legality of anything he does shall not be questioned on the grounds that he should or should not have acted in his discretion if there is any doubt as to whether a matter falls within the scope of the Governor's discretionary powers under this Constitution.
- A Minister ceases to be a Minister at the end of a six-month or longer period during which he or she is not a member of the State Legislature.

## **ACCORDING TO ARTICLE 164**

- The total number of ministers in a state's council of ministers, including the chief minister, cannot be greater than 15% of the members of that state's legislative assembly.
- The Council of Ministers shall be individually and collectively answerable to the State's Legislative Assembly.
- A Minister must take the oaths of office and secrecy from the Governor before taking the oath of office, using the forms provided in the Third Schedule.
- After a period of six months or more without being a member of the State Legislature, a Minister is no longer considered to be one.
- Ministers' salaries and benefits must comply with any laws that the State Legislature enacts from time to time, and they must follow the Second Schedule until the State Legislature changes them.
- The conduct of a state's government's business is covered in Article 166.

## **QUALIFICATIONS**

- If a person is not a member of the state legislature when they are elected to the state legislature, they are unable to serve as a Minister of a State Council.
- He has six months from the date of taking the position to become one.
- In addition, one must meet the following requirements to serve in the state legislature:
  - (a) He must be an Indian citizen.
  - (b) He must demonstrate real trust in and devotion to the Indian Constitution.
  - (c) For the legislative council, he must be at least 30 years old.
  - (d) In the case of the legislative assembly, he cannot be younger than 25 years old.

## **FUNCTIONS AND ROLE OF THE STATE COUNCIL MINISTERS**

### **FORMATION OF POLICIES**

- The policies of the government are created by ministers.
- All major decisions are made by the Cabinet, including those pertaining to public health, disability and unemployment payments, plant disease control, water storage, land tenures and production, and the supply and distribution of commodities.



- When a policy is created, the relevant department puts it into practice.

## **MAINTENANCE OF PUBLIC ORDER AND ADMINISTRATION**

- The executive branch must exercise its authority in a way that ensures adherence to state legislation.
- The Constitution grants the Governor the authority to establish regulations to improve the efficiency of government operations.
- Regarding all such regulations, the Council of Ministers offers advice.

## **APPOINTMENTS**

- The State Public Service Commission members as well as the Advocate-General may be appointed by the Governor.
- The Vice-Chancellors of the State Universities are appointed by the Governor, as are the members of many Boards and Commissions. The Governor cannot choose to make these appointments. He must carry out these obligations, per the counsel of his ministers.

## **THE LEGISLATURE'S DIRECTION**

- Government legislation created by ministries makes up the majority of the bills that the legislature votes on.
- Before the State Legislature, the Ministers present, justify, and defend them. Each year, the Cabinet drafts the Governor's Address, which outlines its legislative agenda, prior to the start of the first session of the Legislature.

## **COMMAND OVER THE STATE EXCHEQUER**

- The State budget, which includes projections for revenue and spending for the upcoming year, is delivered by the Finance Minister to the State Legislature.
- The Legislature is unable to take the lead in the event of a Money Bill.
- Such a Bill can only be introduced by a Minister, and the Governor must recommend it. Regarding financial matters, the Executive does take the lead.

## **EXECUTION OF CENTRAL LAWS AND UNION GOVERNMENT DECISIONS**

- The Union Government may direct state governments in specific circumstances.
- To ensure that the laws established by Parliament are followed, states should exercise their executive authority.



- They shouldn't take any actions that would endanger the Union's executive authority.

### **POSSESSION OF THE STATE EXCHEQUER**

- The State budget, which contains projections for revenue and spending for the upcoming year, is delivered by the Finance Minister to the State Legislature.
- The Legislature is unable to act in the case of a Money Bill.
- Such a Bill may only be introduced by a Minister and requires the Governor's recommendation. With regard to financial matters, the Executive does take the lead.

### **APPLICATION OF CENTRAL LAWS AND UNION GOVERNMENT DECISIONS**

- The Union Government may order state governments to take particular actions under certain circumstances.
- In order to ensure that the laws established by Parliament are followed, states should exercise their executive authority.
- Nothing they undertake should put the Union's executive authority in danger.

### **RESPONSIBILITY:**

There are two categories of obligations:

- Collective accountability
- Shared accountability

### **COLLECTIVE ACCOUNTABILITY:**

- According to Article 164, the state's legislative assembly is the council of ministers' sole source of collective accountability.
- This implies that all ministers are equally accountable for any deeds they commit or fail to commit in front of the legislative assembly.
- They work as a cohesive team and will either sink or swim together.
- All ministers, including those on the legislative council, must resign if the legislative assembly passes no-confidence resolutions against the council of ministers.
- A cabinet decision is binding on all cabinet ministers (as well as other ministers), even if some of them are postponed in the cabinet, according to the idea of collective responsibility.
- All ministers have a duty to support cabinet decisions made both inside and outside

of the state legislature. If a minister disagrees with a cabinet decision, he must resign.

#### **INDIVIDUAL ACCOUNTABILITY:**

- Article 164 also establishes individual responsibility. According to the law, the ministers perform their duties as needed by the governor.
- This indicates that if the legislative assembly has given the council of ministers its support, the governor may remove a minister.
- On the other hand, the governor can only dismiss a minister with the chief minister's approval.
- The chief minister may request a minister's resignation or suggest that the governor dismiss him if he is dissatisfied with his performance.
- All ministers have a duty to support cabinet decisions made both inside and outside of the state legislature. If a minister disagrees with a cabinet decision, he must resign.

#### **A MINISTER BEING APPOINTED TO THE STATE COUNCIL OF MINISTERS**

- The governor appoints the Chief Minister.
- On the chief minister's recommendation, the governor appoints the other ministers.
- Only those individuals who are suggested by the chief minister may be appointed as ministers by the governor.

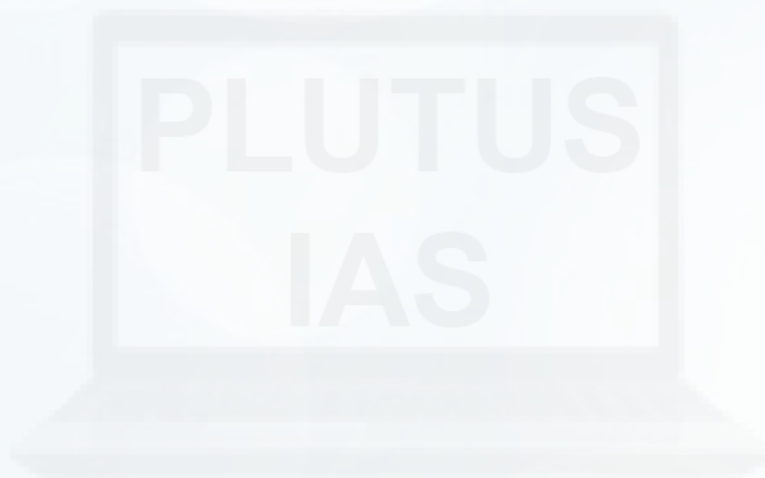
#### **REMOVAL:**

- Members of the state council of ministers may serve at the governor's pleasure, although the chief minister's recommendations are taken into consideration when the governor exercises his authority.

#### **COMPOSITION**

- State Council's membership that ministers
- The council of ministers is made up of deputy ministers, cabinet ministers, and ministers of state. Their rankings highlight the differences between them.
- The key departments are overseen by cabinet ministers.
- Hence it can say that The Council of Ministers sets the state's legislative agenda and is in charge of introducing and approving new laws. The state moves along the path of development more quickly and safely thanks to the powerful state legislative

council. Beginning with the council of ministers, the government's arm expands to enhance the lives of the state's citizens. The history of democracy in India shows how the passage of stringent laws and the enforcement of those laws have changed the lives of many people. The State Council of Ministers can be thought of as the foundation of the executive branch.



## Relationship between Judiciary and Legislature

This article covers “Daily current events “and the topic is about the ‘Relationship between Judiciary and legislature’ which is in news, it covers the “Separation of power” In GS-2, and the following content has relevance for UPSC.

**FOR PRELIMS:** Separation of power

**FOR MAINS:** GS -2, Issues and significance of the separation of power

### **WHY IN NEWS:**

The 83rd All India Presiding Officers Conference will cover topics such as India’s G-20 leadership, the judiciary-legislative relationship, and the efficient operation of Parliament and Assemblies.

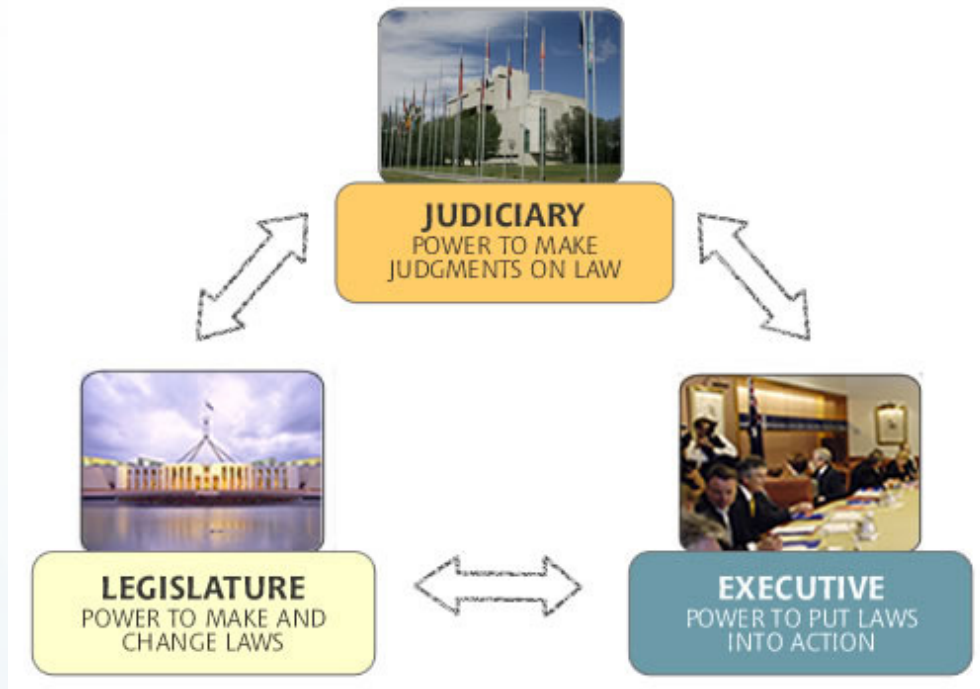
### **ABOUT JUDICIARY AND LEGISLATURE**

- The division of a government’s legislative, executive, and judicial responsibilities is known as the separation of powers. Since all three branches must approve for laws to be made, carried out, and administered, it reduces the likelihood of arbitrary government actions.
- Any branch of the government is prohibited from concentrating too much power due to constitutional delineation.

### **HISTORIC BACKGROUND OF THE DOCTRINE OF SEPARATION OF POWERS**

- Aristotle, who lived in the 4th century BC, originally introduced the idea of separation of powers in his writings, referring to the General Assembly, Public Officials, and Judiciary as the three branches of government.
- On the current design tenet of separation of powers, John Locke’s (1632–1704) constitutional philosophy was elaborated.
- The work of the philosopher Montesquieu, whose work is based on the English system, was produced in the 18th century and is a highly systematic and scientific theory.
- James Madison, the father of the American constitution, stated that the judicial, executive and legislative branches should all have equal power.

## SEPARATION OF POWERS



Separation of Powers

### CONSTITUTIONAL PROVISIONS OF THE JUDICIARY AND LEGISLATURE

- Article 50 states that the state must take action to keep the judiciary and executive branches separate.
- Articles 121 and 211 prohibit discussion of the judicial actions of Supreme Court and High Court judges in the Parliament and State Legislatures.
- Articles 122 and 212 states that no court may challenge the legality of legislative or parliamentary proceedings.
- According to Article 361, neither the President nor the Governor is subject to legal accountability for the way they carry out their official responsibilities.
- The various organs can impose checks on one another through specific provisions in a system of checks and balances.
- For instance the Judicial review, the court has the authority to examine the legislative and executive branches' acts
- If a statute is unconstitutional or arbitrary as defined by Article 13 of the Constitution, the judiciary has the authority to invalidate it (If it violates Fundamental rights)



- The legislature may examine how the executive is conducting itself.
- The administration appoints judges, who serve in an independent judiciary.
- A system of checks and balances makes sure that no organ gains excessive power.

#### **JUDICIAL INTERPRETATIONS:**

<b>Ramajogayya versus the Punjabi government (1955)</b>	<p>The court determined that the constitution does not explicitly reference the notion of separation of powers.</p> <p>When one organ performs the duties of another, it is violated.</p>
<b>IC Golaknath v. Punjab State (1967)</b>	<p>It establishes the legislative branch, the executive branch, and the judicial branch as the three main pillars of power.</p> <p>It establishes the boundaries of the jurisdiction and anticipates that each will execute its authority within those confines.</p> <p>It also makes into the fundamental theory of structure.</p>
<b>Keshavananda Bharati v. Kerala State (1973)</b>	<p>In this decision, the Supreme Court ruled that the parliament's ability to modify the constitution is constrained by fundamental elements of the document.</p> <p>The three state organs were also acknowledged as being governed by the constitution.</p> <p>The ruling establishes the boundaries of</p>

	<p>each party's authority, responsibility, and interdependence.</p> <p>The division of power is said to be a component of the fundamental structure.</p>
<p><b>Raj Narayan v. Indira Gandhi case (1975)</b></p>	<p>The Supreme Court ruled that parliament cannot perform its role since dispute resolution is a judicial duty.</p> <p>The court's ruling noted that unlike the constitutions of the United States and Australia, India only has a loose separation of powers.</p>

## FUNCTIONAL OVERLAPPING OF JUDICIARY AND LEGISLATURE

- Due to the impossibility of tight delineation, each organ tends to encroach on the territory of other functionaries while carrying out its duties.
- For instance, in cases of the impeachment of the President (Article 61) and the dismissal of judges, the legislature performs the judicial duty.
- powers, privileges, and immunities of the executives under Article 105.
- The executive head must follow the guidance and recommendations of the cabinet, according to Article 74(1).
- The Court has the authority to review any constitutional amendments made by parliament.

## CONCERNS REGARDING FUNCTIONAL OVERLAPPING

- Accountability: One drawback of overlapping powers is that one organ cannot be held responsible for its actions. For instance, judicial decisions in the allocation cases for 2G and coal.
- Faith can be eroded by repeatedly interfering with one organ's ability to function in a way that is detrimental to the integrity, effectiveness, and quality of the other organs.
- Accumulation of power: It erodes the spirit of democracy because it weakens the check and balance system when too much power is concentrated in certain political

institutions.

- Negative impact on development: Overstepping one jurisdiction's boundaries may make it difficult for the government to run effectively, harming both public services and overall development.

### **SIGNIFICANCE OF FUNCTIONAL OVERLAPPING**

- Governmental bodies have the authority to stop arbitrary actions by the other two bodies as a check and balance. For instance, the Supreme Court's authority to conduct judicial review
- Rule of law: Power-sharing agreements between the executive, legislative, and judicial branches of government improve accountability and equity in rule of law.
- Reduces scope of dispute among government organs: The constitutional separation of the supreme and subordinate powers limits arbitrary behavior.
- Cooperation: Overlapping functions lead to power decentralization and sharing.

### **JUDICIAL OVERREACH AND JUDICIAL ACTIVISM**

- Judicial activism is the term for the judiciary's proactive role in advancing justice in society and defending the rights of citizens.
- When the court begins to interfere with how the legislative or executive branches of the government conduct their business, that is what is known as judicial overreach.
- Both judicial activism and judicial excess violate the separation of powers, such as when they interfere with the executive's daily operations or make laws or frame policies.
- It talks about the executive's and legislature's inaction.
- creates a judiciary that is active and pro-people. At the same time, it undermines democracy's spirit.
- Suo Moto lawsuits and Public Interest Litigation (PIL) have made it possible for the judiciary to get involved in numerous public matters even when the party in question hasn't filed a complaint.

### **RECENT OCCURRENCES**

- In Delhi, the national green tribunal has banned diesel trucks older than ten years.
- Orders on Diwali fireworks, citing increased pollution and environmental protection.

- The Pegasus case raises serious concerns about the Supreme Court and judicial independence, and it is being used to invalidate the National Judicial Accountability Commission Act, which seeks to ensure transparency and accountability.
- Decriminalization of Homosexuality.
- Supreme Court Instructions in the Prakash Singh Case of 2006: The Supreme Court's seven main instructions in the judgment included establishing the tenure and choosing the DGP (Director General of Police) in order to prevent instances when officers who were about to retire were awarded the position.

### **WAY AHEAD**

- A necessary part of the evolution of democracy is the theory of separation of powers. None of the republic's three distinct organs may assume the duties delegated to the other.
- The executive, legislative, and judicial branches of government work together to fill the gap and ensure efficient operation.
- A Constitutional system with a tight division of powers is unwelcome and impractical for a democratic government and varied population like India. But sensible and deliberate constitutional functional overlap opens the door to democratic cooperation between the three branches of the government.
- Such shared cooperation fills the gap between the executive, legislative, and judicial branches of government, promoting efficient operation.



## Voice of Global South Summit-2023

*This article covers “Daily current events” and the topic is about “The global south summit” which is in news, it covers the ‘international relations and agreements involving India’ In GS-2, and the following content has relevance for UPSC.*

**For Prelims:** About major global south countries

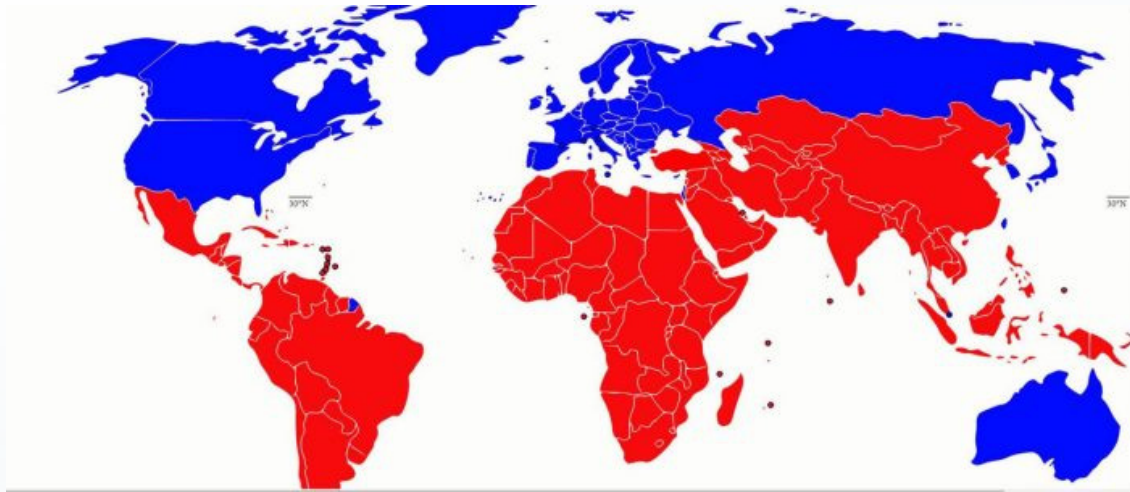
**For Mains:** GS-2, Significance of global south countries

### WHY IN NEWS

- The Voice of the Global South Summit-2023’s Energy Ministers session, with the topic “Energy Security and Development: Roadmap to Prosperity,” was addressed by the Honorable Minister of Petroleum and Natural Gas, Housing, and Urban Affairs.
- The summit was officially launched by the honorable prime minister on January 12, 2023, as a significant gathering of countries to discuss political, economic, social, environmental, cultural, and technical challenges.
- The session acted as a forum to explore suggestions from the developing world for ensuring affordable, practical, and sustainable energy security.

### ABOUT

- India organized the meeting to express the concerns of the developing nations regarding the pandemic and the conflict in Ukraine.
- There are eight ministerial sessions scheduled for the event, including ones on finance, energy, education, foreign policy, and trade.
- The conference’s theme, “Unity of Voice, Unity of Purpose,” fundamentally entails bringing together countries from the global south to discuss their goals and viewpoints on a wide range of issues.



### **GLOBAL SOUTH SUMMIT**

Figure- Many nations in the Northern Hemisphere are included in the Global North (in blue), as well as some in the Southern Hemisphere like Australia and New Zealand. The countries that make up the Global South (in red) are mostly in the southern hemisphere but also some are in the northern hemisphere.

### **ABOUT GLOBAL SOUTH**

- India invited more than 120 nations to the summit, which is referred to as the Global South and encompasses the developing and less developed nations of the world.
- The purpose of the summit is for India to work to make sure that the G20 summit, which will be hosted by India later this year, would advance the inputs received from partner nations during the Voice of the Summit discussions.
- India's current G20 Presidency offers a unique and powerful opportunity for nations whose voices are frequently ignored.

### **GLOBAL NORTH AND GLOBAL SOUTH OF THE WORLD**

- The idea of the global north and south, sometimes known as the north-south divide in a global context, refers to a collection of nations that have similar socioeconomic and political traits.
- Latin America, Asia, Africa, and Oceania collectively are referred to as the "Global South" in this context. It is one of a group of terms, including "Third World" and "Periphery," that refers to areas outside of Europe and North America. On one side of the alleged divide, which is made up of the countries of the Global North, are primarily (though not always) low-income and frequently politically or culturally marginalized nations (often equated with developed countries).
- The majority of the Global South, for instance, is geographically located in the North-

ern Hemisphere, hence the word does not necessarily relate to a southern region.

- First introduced as a more open and value-free substitute for “Third World” and similarly potentially “valuing,” the word is now used by governments and organizations focused on development.
- The term, as it is now used by governmental and developmental organizations, was initially developed as a more open and value-free replacement for “Third World” and related, potentially “valuing” terminology like developing countries. The countries in the Global South are frequently still under the effects of colonialism today or have recently begun the industrialization process.

## **UNIFYING THE GLOBAL SOUTH**

- The Prime Minister has set the stage through this event on behalf of developing nations, many of whom are connected by a shared history of colonialism.
- India offered to speak for the countries of the Global South and presented a new agenda to the globe at the event, which was entitled “Respond, Recognize Respect, and Reform.”
- Asia, Africa, and South America are together referred to as the “Global South.”

## **CURRENT CRISIS**

- In accordance with PM, the world is enduring a crisis, and it is unclear how long this “state of instability” will remain.
- The “eight-decade-old model of global governance” does not give the Global South a meaningful voice, and it should influence the “emerging order.”
- According to him, It hasn’t been responsible for most global problems. But we feel the effects more. This has been demonstrated by the COVID pandemic, climate change, terrorism, and even the crisis in Ukraine. Additionally, our role or voice is not taken into account in the search for solutions.
- India’s objective is to represent the Global South in 2023.
- Our goal is to raise the voice of this organization as India begins its G20 Presidency this year.

## **SIGNIFICANCE**

### **SIMILARITIES:**

- The labels of the South are distinguished by two factors. First, they may be more accurate at classifying nations by comparing their income, healthcare, and education indices, among other factors.

- The fact that most of the South's nations have a history of colonization, mostly at the hands of European powers, is another thing they share in common.

#### **CURRENT NECESSITIES:**

- Part of the reason the idea is being reemphasized now is the recent economic rise of some of these South Asian nations, including China and India.
- Many believe that multiple powers now influence worldwide politics, as opposed to just the US.
- The advancements made by many Asian nations are also seen as undermining the notion that the North is the deal.

#### **WAY AHEAD**

- In this multipolar world, the entire North and South must cooperate to address the problems facing both established and developing nations and to advance the interests of the East in the same way as the West.
- Some economists have proposed that unrestricted capital flows between nations and global free trade might reduce the gap between the North and the South.
- If trade and capital flows were more equitable, developing nation's ability to advance their economic development might be possible.
- There is evidence that some South American nations are developing quickly and providing a lot of aid to other South American nations.



## India China trade deficit

*This article covers “Daily current events “and the topic is about the ‘India China trade deficit ’ which is in news, it covers “International relations” In GS-2 and GS-3, and the following content has relevance for UPSC.*

**For Prelims:** India china trade ties, major import and export item

**For Mains:** GS-2, GS-3, India and its neighborhood, Growth, and development

### HOW DO THE TRADE TIES BETWEEN CHINA AND INDIA STAND

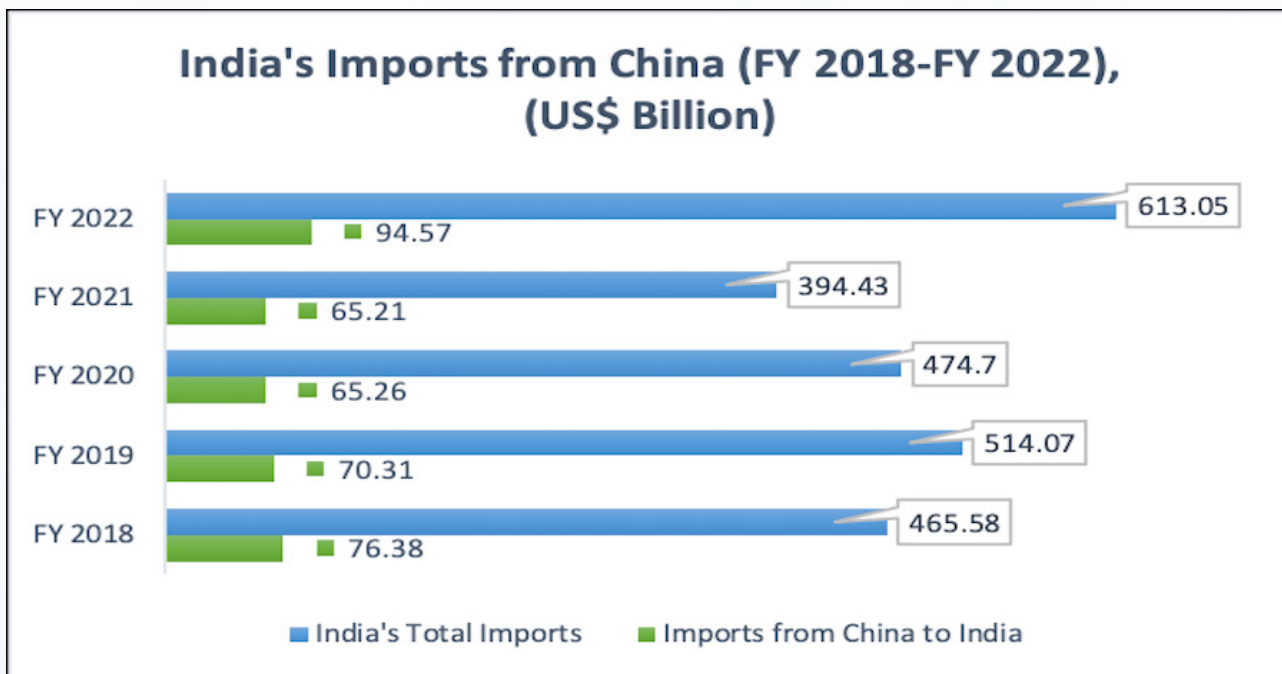
- China is India’s second-largest trading partner after the US. One of the Biggest Partners.
- About 20 years ago, China’s ranking among trading partners was 10, but since 2002 or 2003, it has moved up the list.
- In 2011–12, 2013–14, 2017–18, and 2020–21, China was India’s largest trading partner.
- For the years 2021–22, the US and China were India’s top two commercial partners, followed by the UAE, Saudi Arabia, Iraq, Singapore, Hong Kong, Indonesia, South Korea, and Australia.

India’s imports from China	India’s imports from China are \$118.5 billion, an increase from \$97.5 billion.  Over 21% more Chinese items were imported into India last year.
India’s exports to China	From \$28.1 billion to \$17.48 billion, India’s exports to China decreased.  From \$69.4 billion in 2021, the trade imbalance increased by 45% to \$101.02 billion in 2022.
Trade overall	In 2022, India and China’s bilateral trade hit a record \$135.98 billion.  8.4% more people had it last year.

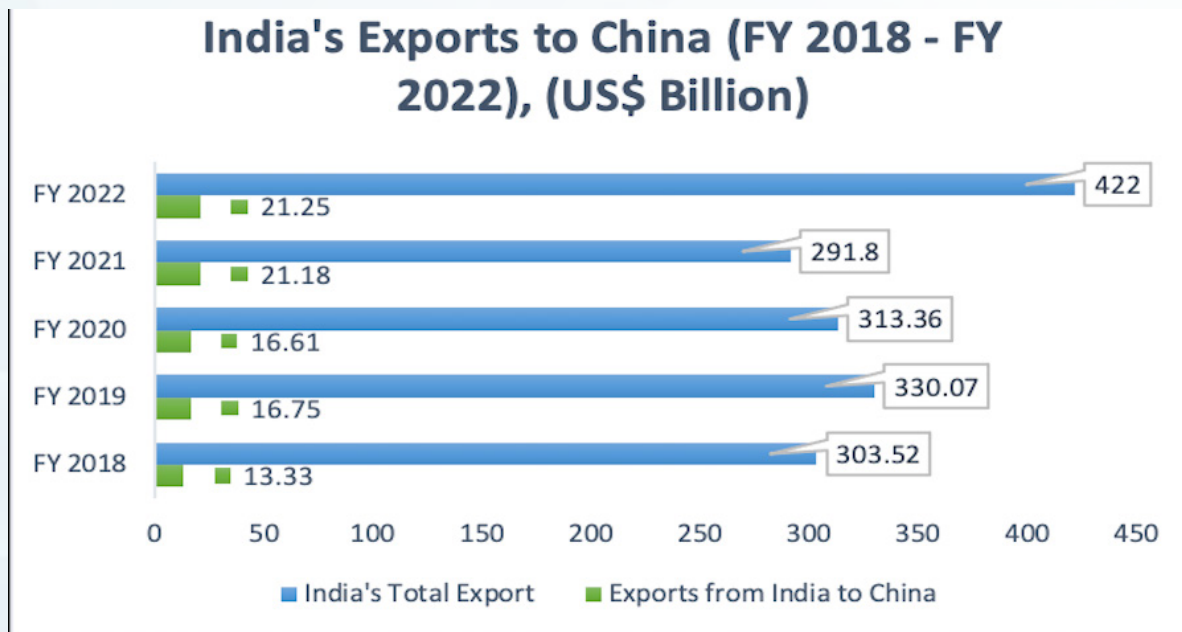
## DIFFERENCES IN THE TRADE BETWEEN INDIA WITH CHINA AND THE US

- The biggest difference in India's trade with the US and China is that while it has a trade surplus with the US (USD 32.85 billion in 2021-2022), it has the largest trade deficit with China (USD 73.31 billion in 2021-2022) of any nation.
- While India's imports from China climbed from USD 2 billion to USD 94.57 billion between 2001-02 and 2021-2020, the country's exports to China increased just marginally, from roughly USD 1 billion to USD 21 billion.

### India China trade



### Exports to China



## Major Imports:

The top Chinese exports to India are:	most valuable Chinese imports:
<ul style="list-style-type: none"><li>▪ Electrical devices and parts thereof</li><li>▪ television image and sound recorders,</li><li>▪ reproduction devices, and accessories</li><li>▪ Boilers, machinery, and other mechanical devices and parts of thereof organic substances</li><li>▪ Plastic and items made of plastic</li><li>▪ Fertilizers</li></ul>	<ul style="list-style-type: none"><li>▪ Personal computers (laptops, palmtops, etc.),</li><li>▪ monolithic integrated circuits for digital devices,</li><li>▪ lithium-ion batteries,</li><li>▪ solar cells, and</li><li>▪ Urea</li></ul>

## MAJOR EXPORTS

India exported 5% of its total shipments to China in 2021–2022.

Among the biggest exports were :

- Ores, slag, and ash.
- Mineral fuels/oils and their distillation byproducts, bituminous compounds, and mineral waxes;
- steel and iron
- Articles of aluminum
- Cotton
- Light Naphtha was India's most valuable export among individual goods.

## CHINA'S HEAVY IMPORT DEPENDENCE IMPLY

- The state's difficulties in terms of politics and security are exacerbated, in the eyes of the administration, by its reliance on importing goods from hostile nations.
- The majority of the active pharmaceutical ingredients (APIs) used in India are imported. The majority of the Active Pharmaceutical Ingredients (APIs) used by India's pharmaceutical sector are imported from China. Chinese APIs are less expensive

than Indian ones, even in the Indian market.

- When supplies of Chinese APIs to India were temporarily halted due to travel restrictions during the Covid-19 outbreak, India had to reduce its own exports of APIs as a result, exposing the extent of the issue.
- It's possible that 24% of the coal energy produced in India comes from facilities that use essential Chinese imports. So while this might not be a clear-cut case of strategic reliance, it is unquestionably a security challenge.
- Although there are calls to restrict or even ban such imports from China, doing so would just result in the private Indian power companies having to bear greater expenses.

### **WHAT HAS INDIA DONE TO COMBAT CHINA'S OVER-RELIANCE?**

- Chinese apps are prohibited
- Considering Chinese investments carefully and excluding Chinese companies from 5G testing
- Limiting opportunistic acquisition of domestic companies: FDI limit on China
- Promoting bulk drug parks and the PLI Scheme will reduce API import needs.
- Chinese power equipment imports are effectively prohibited
- Anti-dumping taxes were imposed on some chemicals and aluminum products for a period of five years in order to protect domestic manufacturers.
- Identification of 12 industries that can help India become a global supplier and reduce import costs:
- Food processing, organic farming, iron, aluminum, copper, agrochemicals, electronics, industrial machinery, furniture, leather goods, shoes, auto components, textiles, as well as coveralls, masks, sanitizers, and ventilators, are some of these industries.

### **CURRENT ACCOUNTS DEFICIT (CAD)**

It is the difference between the amount of money coming in via exports and the amount leaving the country through imports. It calculates the difference between the amount of money coming into and leaving the country through the exchange of products and services, as well as the movement of funds from domestically owned manufacturing equipment to foreign countries.

### **DIFFERENT FROM THE TRADE BALANCE**

- It differs slightly from the Balance of Trade, which simply calculates the difference



between income and expenses for exports and imports of goods and services.

- While the current account also takes payments from local capital sent abroad into account.
- For instance, the current account would be used to calculate the rental income from an Indian's home in the UK, but not in the balance of trade.

### **REASONS**

- Exchange rate in effect, amount of consumer spending, capital inflow, inflation level, and current interest rate.
- Imports of crude oil and gold are the main causes of India's huge current account deficit.

### **IMPLICATIONS**

- Depending on why an economy is running a deficit, the current account deficit may be a positive or bad indicator for that country.
- In the short run, it might be beneficial for a debtor country, but in the long run, it might cause investors to worry about getting a sufficient return on their investments.

### **WAY AHEAD OF INDIA CHINA TRADE**

- By increasing exports and reducing imports of non-essential goods like electronics, gold, and mobile phones, it might be decreased.
- It would also be helpful to make it simpler for manufacturing companies to raise overseas capital and hedge their currency exposure.
- Among other things, the government and RBI may look into reviewing the FPI debt investment limits.
- India still has to import the majority of its essential goods to maintain its strategic competitiveness. It may, however, diversify this dependence by minimizing China's contribution to it.
- By collaborating more with the United States, Europe, South Korea, and Japan, India can diversify its reliance. It will become more dependent on nations with whom it already has cordial political ties as a result.
- A wise course of action is to further encourage self-reliance in key areas where India is a net importer, and where technology and money will play a significant role.

## DEMAND FOR THE DISTINCTION BETWEEN “REAL MONEY GAMES” AND “VIDEO GAMES”

*This article covers “Daily current events “and the topic is the Demand for the distinction between “real money games” and “video games” in Online Gaming Industry, which is in news, it covers “IT and computers” In GS-3, and “Government policies and interventions” In GS-2, the following content has relevance for UPSC.*

**For Prelims:** IT and computer

**For Mains:** GS-2, GS-3, Factors involves in online gaming

### WHY IN NEWS:

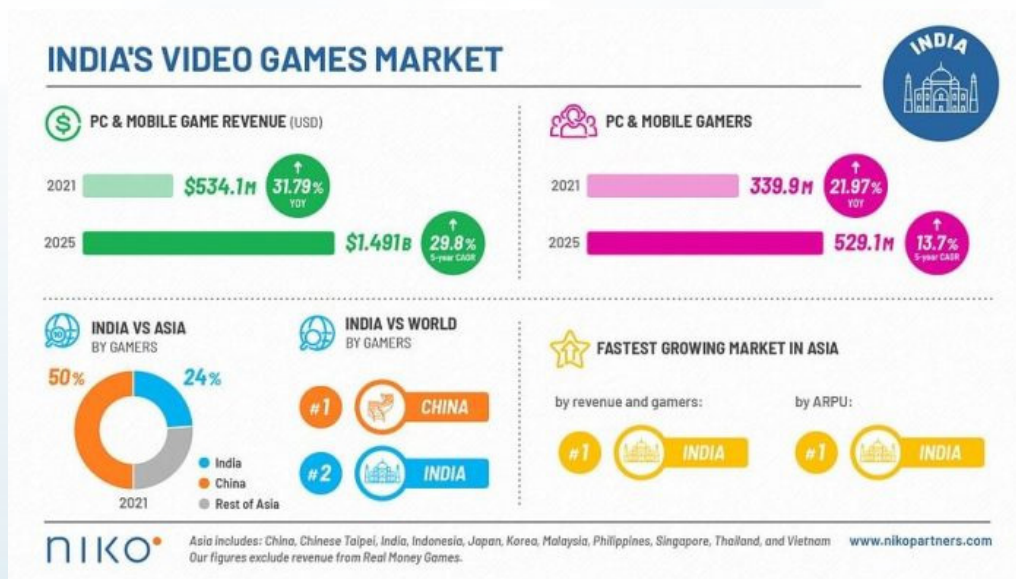
- In light of the upcoming changes to the IT (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021, over 40 Indian video game and e-sports companies have written a letter to the Ministry of Electronics, Information, and Technology (MeitY) requesting a regulatory distinction between them and “real money games.”
- The Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021 were amended by the MeitY, who also earlier published the Draft Rules for Online Gaming.
- The letter urges MeitY, which it refers to as “the nodal agency for “online gaming,” to understand the distinction between the two markets.

### ABOUT

- Real Money Gaming is any game played through an online medium in which real money is staked on the outcome, including casino, bingo, poker, sports or sporting events, skill games, etc. Real Money Gaming includes all of these activities.
- While A video game is a digital or computerized game that you can play on a computer or television.
- Online games must be played through an online connection. This is a sector of the rising business, and access to various gaming types is becoming more and more popular these days. For instance, poker, rummy, and other augmented reality-based artificial intelligence games.
- The country is the largest fantasy sports market internationally, with more than 13 crore players spread over more than 200 sites. According to the authorities, the number of people playing online rummy has increased. India separates the games mostly into two big categories.

## THERE ARE TWO TYPES OF THE GAME:

- The term “game of chance” refers to any game that is played at random. These games primarily rely on luck. These games don’t require any prior understanding or knowledge to play. A few examples are playing dice games, selecting a number, etc. These games are regarded as illegal in India.
- A game of skill is any of the several video games that are played based on the player’s prior knowledge or level of gaming prowess. A person will require skills including the capacity for making analytical decisions and logical thought. Some games may also require some initial practice to be successful. The majority of Indian states view these games as legal.



## India's Video Games market

## FACTORS INFLUENCING THE ONLINE GAMING INDUSTRY

- The demand for the online gaming industry increased as a result of the Covid 19 restrictions and lockdown, which caused individuals to be out of the office, attend online classes, work from home, etc.
- The gaming industry underwent evolution. Growing tech businesses began showing interest in it because of the profitability involved as a result of the increase in investments made to meet the rising demand for online games.
- Thanks to technology improvements and cloud computing, there are now more gaming possibilities available.
- Another factor for the growing accessibility of these games may be the reasonably priced internet.
- Aside from the various age groups, the population is getting younger, and more peo-



ple are becoming interested in playing online games, which has led to an increase in users.

- The newly undertaken Digital India initiatives have a direct impact on the expansion of the gaming industry. Due to digitization, more people have access to the Unified Payment Interface (UPI), hence the industry is growing in terms of both user numbers and monetization.
- According to the World Economic Forum (WEF), mobile devices dominate the Indian gaming industry. Observations show that the growth of the gaming industry is a result of the use of smartphones. Mobile gaming predominates in today's market. availability of smartphones with superior gaming capabilities.

### **ADVANTAGES OF ONLINE GAMING**

- Because they will be occupied, adolescent offenses will decline because they won't engage in risky or damaging social activities. Additionally, it will lead to a decrease in illicit activity. For instance, games like Dream 11 may lead to a decrease in unlawful betting.
- Through the taxes placed on online gaming, the government may see an increase in revenue. And as a result, it will assist the government in cutting the deficit and building out the infrastructure.
- The educational games will keep the kids entertained while assisting them in learning various concepts clearly and straightforwardly.
- For many people with an interest in this field, it will open up career prospects. Animations, for instance, or IT start-ups, etc.
- E-sports may become more widely accepted as a result, and it will give India more opportunities to succeed internationally. For instance, e-sports like pub g will make their debut as medal events at the Asian Games in 2022.
- It will encourage technological advancement and innovation in immersive and interactive media. Take augmented reality, for instance.

### **ISSUES AND CONCERNS**

- There could be psychological and bodily consequences. For instance, aggressive conduct and greater aggression may occur from constantly being in gaming mode. A blue whale challenge can involve a true incident.
- The public has a mediocre understanding of the law. Another issue is that betting and gambling are on state lists, which means that different states will have different rules.



- Obesity, visual disorders, arm injuries, anxiety, stress, disturbed sleep patterns, and irregular eating habits are major health issues that may have long-term effects. Additionally, a gaming addiction may interrupt social interactions and bring about financial losses.
- This may cause the younger generation to become distracted by video games, negatively affecting how well that generation performs academically. And as a result, the youth's moral ideals and social and cultural connections will be lost.
- Due to the potential for increased turmoil and the emergence of unlawful apps, the absence of any national controls and legislation on online gaming would provide additional difficulties for the government and administration to handle.
- As a result of the financial losses, there will be an increase in aggression towards women and children both inside and outside the home because the offender will continue playing games even after the negative effects.
- Damage to the body, society, and emotions will result. There will be poor sleep, professional disruptions, and no social life. Since gaming, financial hardship, and social isolation currently occupy the majority of their time, they will continue to do so.
- Cyber assaults, privacy concerns, data mining, identity theft, money fraud during gaming transactions, and other threats will exist.

## **CONCERNS REGARDING IT RULES 2021**

### **SIMILAR REGULATORY SCOPE**

- A self-regulatory organization that will confirm an Indian online game is approved is proposed as part of the IT Rules, 2021 modifications.
- In the current draught notification, "video games" and "online games played for stakes" are regulated under the same umbrella.
- No nation in the world recognizes or regulates these two types of games similarly.
- However, gaming businesses are concerned about how there isn't a clear line between them and "real money games" (RMG), which are frequently in a grey area because of state gambling laws and regulations.

### **SIMPLY FOR FUN**

- Video game firms claim that "games do not entail staking money and are played solely for fun."
- They note that in other nations, Real Money Games and Fantasy Sports are referred to as the "iGaming Industry" as a whole.

## THEIR DEMANDS

- Formation of a body: It is essential to establish an appropriate structure that respects the specifics of the business and is in line with international best practices if India is to produce video games of the highest caliber for a worldwide audience.
- This will significantly improve India's ability to attract finance, expand its market reach, collaborate with foreign companies more frequently, cultivate talent pools, and produce world-class athletes.

For regulations: By international standards like PEGI (Pan-European Game Information) in the European Union and ESRB (Entertainment Software Rating Board) in North America, video games are regulated through an age and content rating mechanism specific to India by establishing a video games industry-specific self-regulatory body (SRB).

Framework for further issues: Establish a strong framework to address issues like children's video game addiction, their exposure to in-game purchases, age-inappropriate content, and online harm.

This framework will be regulated by a self-regulatory body specific to the video game industry by international standards like COPPA (Children's Online Privacy Protection Rule) in the USA and GDPR (General Data Protection Regulation) in the European Union.

## WAY AHEAD

- Proper gaming regulation for all parties involved is urgently needed, or the center should be given the authority to enact rules and regulations using either the residuary powers under article 248 or the control under article 252.
- To unify regulations and maintain uniformity in the laws across India, there has to be one regulatory agency overseeing the whole online gambling sector.
- In addition, parents need to be accountable for their children's gaming habits and time spent online. They should also be aware of potential negative impacts and work to influence their children to play educational games, among other things.
- There is an urgent need to raise awareness of online gaming, its adverse effects on children's growth and development, its ripple effects on society, and the value of maintaining discipline even when used.
- A license is required for the sector. It is necessary to establish numerous safety checks. It is necessary to involve the sector as a self-regulator rather than having a policy.
- To fully exploit the potential of the online gaming industry, the State and Union Governments should work together to create precise standards in conjunction with industry partners.

# Geopolitics of Eurasia for India

*This article covers “Daily current events “and the topic is” Eurasia and the current geopolitical situation” which is in news, it covers the “International relationship” In GS-2, the following content has relevance for UPSC.*

**For Prelims:** Russia-Ukraine, NATO, QUAD, AUKUS

**For Mains:** GS-2, India, and new Eurasia and geopolitical situations

## WHY IN NEWS:

As 2023 gets underway, the world is embracing a “new normal” in which ancient and new fault lines in Eurasia and the Indo-Pacific are being rearranged.

## ABOUT EURASIA

- Eurasia as a concept is not new. Many people used it as a descriptor that was both neutral and a large land mass that united Europe and Asia.
- Despite geographical continuity, over the centuries, Europe and Asia developed into distinct political and cultural realms.
- Eurasia is a tectonic plate that geographically underlies much of Europe and Asia. There is no universal agreement on what the territory’s political borders are, though, and this is a problem for the region.



Colored Eurasia Map with Country Names and Capital Cities

## APPROACH OF RUSSIA

Although it struggled to integrate into either, Russia regarded itself as a force in both Europe and Asia. As new geopolitical conceptions, it created “Eurasia” and “Greater Eurasia.” Putin sees it as his historic mission to bring the “Russkiy Mir,” or the Russian world, back together, which led to the 2014 invasion of Ukraine and the takeover of Crimea. Despite the significant expenditures of the scheme, he was adamant that he would pursue it.



## CHANGES ASSOCIATED WITH THE NEW EURASIA

- Japan: The country is adamant about forming reliable military alliances with Europe. The prime minister of Japan made a straightforward statement: “The security of Europe and the Indo-Pacific is indivisible.” Japan will also develop a substantial missile arsenal to intimidate China (and North Korea, whose missile capabilities have grown).
- US: The NATO summit in Madrid in June invited important Asian partners to join at the US’s request. Along with the president of South Korea, the summit was attended by the prime ministers of Australia, Japan, and New Zealand. Asian leaders are taking part in NATO discussions for the first time. Eurasian geopolitics will continue to be characterized by new elements, such as NATO’s engagement with Indo-Pacific challenges and East Asia’s engagement with European security. The Biden Administration expressed its intention for its allies and partners in Europe and Asia to cooperate more with one another in its National Security Strategy, which was published in 2022. It is eager to support the advancement of its allies, particularly India, in their efforts to bolster the regional power structures in both Europe and Asia.
- South Korea is increasing its visibility in Europe to join the party as well. It sells significant weapon platforms in Poland.
- Australia: Equally eager to include Europe in the Indo-Pacific is Australia, which has joined the US and UK in the AUKUS agreement.
- Russia and China’s cooperation: The geopolitical landscape in Eurasia was changed by China and Russia before Japan and South Korea went to Europe.

Putin traveled to Beijing in February 2022 to sign a document that declared an alliance “without limits” and no “forbidden zones” just days before he gave the order for his army to invade Ukraine.

Together, Putin and Xi revealed a Eurasian alliance in the hopes that it would be the long-awaited final blow to Western hegemony.

## EURASIA’S IMPORTANCE TO INDIA

- Resources: The Eurasian region is abundant in natural resources, particularly energy resources, which are distinguished by large production and exports. India’s interests must be protected through economic cooperation with these nations. In terms of energy (oil, natural gas), and natural resources, the Eurasian states are potential long-term allies (that include uranium and iron ore).
- Pharmaceutical: The medical and pharmaceutical industries also present a great deal of room for collaboration. By establishing public hospitals and clinics in Eurasia, India is prepared to increase cooperation. India is planning to create a Central



Asian e-network with India as its core to provide connectivity for tele-education and telemedicine, connecting all five Central Asian States.

- Industry of construction: Indian firms can demonstrate their skill in the field and develop constructions of the highest caliber at affordable prices. Iron ore, coal, and inexpensive power are all found in almost endless quantities in Central Asian nations, particularly Kazakhstan. India can assist in building a number of medium-sized steel rolling mills that will produce the specialized goods it needs.
- Economic benefits: Eurasia's strategic peninsular location connecting several subregions of Asia and West Asia makes it vital for India's goal of becoming an economic hub. Recent programs like Make in India, Skill India, and Digital India may very well help with this. If India integrates economically with other regions of Asia, it may also be used as a tool to take advantage of the demographic dividend in India.
- Strategic importance: Strategically, the Eurasian region wants to become less dependent on both Beijing and Moscow. In light of this, they are ready to assist India in its efforts to improve its standing in the area and offer a viable alternative to the established actors Russia, China, the EU, and the US. A qualitative improvement in India's relations with the Eurasian states is made possible by the simultaneous implementation of the Iran nuclear deal and Russia's confrontation with the West.
- Tourism: India is a developing tourist destination. Eurasia is crucial for attracting tourists from the continent. To draw more tourists, India should build beaches and luxury accommodations.

### **WAY INDIA EXPANDS ITS INFLUENCE**

- Provide regular and frequent shipping connections between Chabahar and the Indian ports of Mundra, Kandla, and Mumbai.
- Support the planned joint Afghan-Uzbek project to extend the 700 km long railway line from Mazar-i-Sharif to Herat, which would go through western Afghanistan. All of Central Asia, including Tajikistan and Kyrgyzstan, would be connected to the Chabahar route via western Afghanistan if this project were to succeed.
- In order to position Chabahar as a crossing point between Eurasia and the Indian Ocean, India has to enlist the aid of one or more Central Asian nations, especially Uzbekistan and Kazakhstan.
- The SCO framework might potentially be used to promote connectivity cooperation with these nations.
- Without necessarily engaging in direct conflict or rivalry with China's BRI, India should forward its own connectivity strategy for Eurasia. India may undoubtedly benefit from assistance in moving toward Eurasian integration with Russia, Iran,

and Central Asian nations.

- In order to link to the Far East and even Japan, India should work to join Russia's "Greater Eurasian" corridor and the Northeast Passage in addition to INSTC and Chabahar Port.

## CONCERNS

- The rise of Eurasia makes it more difficult for India to sail on two boats at once. Up till this point, India could easily run concurrently with the continental coalitions led by Russia and China and hunt with the marine coalition (the QUAD) in the Indo-Pacific.
- As long as the maritime and continental powers did not engage in open hostilities, this was possible.
- But the battle between China and Russia and the US, Europe, and Japan is now severe and doesn't appear to be going away anytime soon.
- The cloud cast over India's continental strategy will therefore get deeper in the days to come due to the growing security threats from China along its Himalayan border and the strengthening of relations between Moscow and Beijing. Positively, there have never been more opportunities to bolster India's strategic capabilities through alliances with the US, Europe, Japan, South Korea, and Australia. Delhi must now seize the opportunities that are opening up.

## WAY AHEAD

- India must exert the same effort toward the creation of a "Eurasian" policy that Japan and South Korea do. India's continental strategy needs to be reevaluated in relation to Eurasia, while the Indo-Pacific is about Delhi's new marine geopolitics.
- India has dealt with each of Eurasia's constituent regions separately over the years, but Delhi now needs a coordinated strategy to gain a firm presence in the region.
- India will undoubtedly run into many conflicts along the way with the US, Europe, Russia, China, Iran, and the Arab Gulf, but it shouldn't let these conflicts stop it from progressing.
- Increased strategic action in Eurasia that creates opportunities in all directions is the key for India.

## Annual Status of Education Report (ASER)

*This article covers “Daily current events” and the topic is the ‘Annual Status of Education Report (ASER)’ which is in news, it covers “Education” In GS-2, and the following content has relevance for UPSC.*

**For Prelims:** About ASER report findings

**For Mains:** GS-2, Government policies, and interventions, Education

### WHY IN NEWS:

The Pratham Foundation recently published the Annual Status of Education Report (ASER), a countrywide assessment that examines the effectiveness of learning in schools.

### ABOUT ASER

- The country's level of fundamental literacy and numeracy is captured by this important annual, citizen-led household countrywide survey.
- It tries to ascertain whether or not students in rural India are enrolled in classes and are gaining knowledge.
- At the national, state, and district levels, the survey provides representative estimates of the enrollment status of children aged 3 to 16 as well as their proficiency in basic reading and math skills.
- The first ASER, which was done in 2005 and repeated annually for ten years, is directed by the Pratham Foundation.
- After a break of 4 years, ASER 2022 will be the nation's first field-based “basic” ASER. It occurs just as students are returning to class after a protracted period of school closure.

### TOOLS OF TESTING OF ASER

- Reading Tools – The ASER reading assessment tool is divided into four levels: letters, words, a brief paragraph (text at the standard level 1), and a lengthier “story” (Std 2 level text). The youngster receives the best grade she can safely complete.
- Maths Tool – There are four levels in the ASER Math tool: number recognition (1–9), number recognition (11–99), two-digit subtraction with borrowing, and three-digit



by one-digit division. The youngster receives the best grade she can safely complete. A youngster who is unable to complete the first level will be designated at the “Beginner” level.

## KEY FINDINGS OF ASER

### ADMISSION AND ATTENDANCE

- The number of students enrolled generally increased between 2018 and 2022, notwithstanding the pandemic-related closures of some schools.
- Between 2018 and 2022, there was a significant increase in the percentage of kids (aged 6 to 14) enrolling in government schools.
- The percentage of 11–14-year-old girls not enrolled in school in all of India in 2022 is 2%, continuing the downward trend that began in 2006.
- In 2022, there were more 3-year-olds who were enrolled in some kind of early childhood education.
- Additionally, nationwide, from 26.4% in 2018 to 30.5% in 2022, more students in grades I through VIII were enrolled in paid private tuition programs.
- The average teacher attendance rate grew somewhat between 2018 and 2022, but the average student attendance rate has remained stable at roughly 72% for the past few years.

### KEY TAKEAWAYS

- Proportion of children in govt schools up from 65.6% in 2018 to **72.9%** in 2022
- Children taking private paid tuitions up from 26.4% in 2018 to **30.5%** in 2022
- Reading levels down to pre-2012 levels – only

### ENROLMENT IN 6-14 AGE GROUP AT A RECORD HIGH:

**98.4%** children now enrolled in school, up from 97.2% in 2018

20.5% children in Class 3 can read a Class 2 textbook, down from 27.3% in 2018

Annual Status of Education report

### BASIC LITERACY LEVEL

- Readability at the Basic Literacy Level significant decline in math and reading skills,
- Children’s fundamental literacy levels have declined significantly, with reading abil-



ities declining much more steeply than numeracy skills and returning to pre-2012 levels despite the excitement parents and students show for schools.

- The proportion of Class 3 students in public or private schools who could read at the level of Class 2 fell from 27.3% in 2018 to 20.5% in 2022.
- States with better reading proficiency in 2018 such as Kerala (from 52.1% in 2018 to 38.7% in 2022), Himachal Pradesh (from 47.7% to 28.4%), and Haryana (from 46.4% to 31%) show declines of more than 10 percentage points from 2018 levels.
- Nationally, the percentage of Class 5 students in public or private schools who can at least read a text at the Class 2 level dropped from 50.5% in 2018 to 42.8% in 2022.
- For kids in Class 8, the declines in basic reading proficiency are less; from 73% in 2018 to 69.6% of students enrolled in public or private schools in 2022 were able to read at least basic text.

### **MATHEMATICAL AND CALCULATION SKILLS**

- From 28.2% in 2018 to 25.9% in 2022, class 3 students who could at least subtract decreased in proficiency.
- Additionally, from 27.9% in 2018 to 25.6% in 2022, the percentage of Indian students in Class 5 who can do division has decreased marginally.
- Students in Class 8 perform fundamental math with a wider range of abilities. From 44.1% in 2018 to 44.7% in 2022, the percentage of kids nationwide who can divide has slightly risen. This rise is the result of better results for girls and students attending public schools, whilst boys and students attending private schools exhibit a fall from 2018 levels.
- Government school students in Class 8 fared much lower in Punjab (from 58.4% to 44.5%) than in Uttar Pradesh (from 32% to 41.8%) and Chhattisgarh (from 28% to 38.6%) in 2022 compared to 2018.

### **TUITION CLASSES**

- The data also reveals a sharp increase in the number of pupils enrolling in tuition classes. There is a rise in the percentage of kids who attend tuition classes between 2018 and 2022 across all states.
- Families that wanted to save money on tuition fees removed their children from private schools, but they also made investments in private tuition classes, which climbed as the percentage of these pupils increased from 26.4% in 2018 to 30.5% in 2022 in both private and government schools.
- The fact that most students choose to study math and science in their tuition pro-

grams, may also explain why reading learning gaps are more pronounced.

### IMPACT OF THE COVID PANDEMIC ON GIRLS' EDUCATION

- The research also allays concerns that the pandemic would cause families to pull their daughters out of school and drive them into young marriages.
- In the age range of 11 to 14 years, it is discovered that the proportion of girls who were not enrolled in school decreased from 4.1% to 2%.
- The proportion of older females in the 15–16-year-old age range who are not enrolled in school has decreased even more dramatically, from 13.5% in 2018 to 7.9% in 2022.

### MAJOR CONCERNS

- Resources are insufficient: India's education spending as a percentage of GDP is 3.1%, falling short of the 6% objective set for NEP 2020.
- Bias in favor of the English language: Children in rural areas have had difficulty studying because of the emphasis on the English language.
- Lack of Practical Experiences: Prioritizing theoretical knowledge over practical understanding.
- The teacher counts: The teacher-to-student ratio is too low.

### MEASURES WERE TAKEN BY THE GOVERNMENT

Elementary Education	Sarva Shiksha Abhiyan Mid-Day Meal Mahila Samakhya
Secondary Education	Rashtriya Madhyamik Shiksha Abhiyan Girls Hostel Scheme National Scheme of Incentives to Girls for Secondary Education Inclusive Education for the Disabled at the Secondary Stage Scheme of Vocational Education National Merit-cum-Means Scholarship Scheme
	Rashtriya Madhyamik Shiksha Abhiyan
For Infrastructure	Scheme for construction and running of Girls' Hostel for students of secondary and higher secondary schools
others	Scholarship schemes for Minority students National Scholarships

# RESERVATION IN INDIA

*Reservation in India is a form of affirmative action whereby a share/percentage of seats is reserved for marginalized/backward sections of society who are inadequately represented in public institutions.*

**Relevance for Prelims:** Affirmative Action by state

**Relevance for Mains:** Reservation in India and its need in contemporary times

Given that our country is in midst of a growth process, it is important to articulate the weigh the advantages and fallouts of reservation policy.

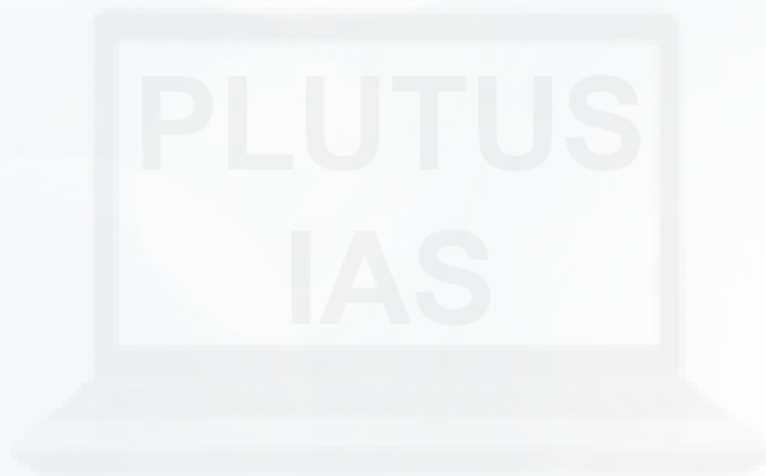
## NEED OF RESERVATION IN INDIA AT THE PRESENT TIME

- **Preamble:** The affirmative action policy creates a social order which is one of the foremost objectives of the preamble to secure underprivileged sectors in society to ensure equity.
- **Increased Oppression:** Violence related to caste has increased substantially. (NCRB Report 2021). A peaceful and inclusive society remains a distant dream.
- **Equal Opportunities:** Many ethnic groups/financially backward groups have been historically excluded from society which makes them backward. In order to ensure equality and equity, the government has passed the 103rd Constitutional Amendment Act.

## NEED TO RELOOK AT THE RESERVATION POLICY

- **Casteism:** Demand for reservation has also fueled ideologies based upon caste which hinders the social capital of the country. Reservation further divides the people based on primordial identities.
- **Death of Meritocracy:** The reservation policy has carved out majority space for backward sections of society which provide the selection of candidates at a lesser threshold which denigrates the individual from the general category.
- **Administrative Efficiency:** The decreased threshold for entry into civil services could also impact administrative efficiency given the person in the future holds very strategic positions.
- **Vote Bank Politics:** The government in order to secure a majority in elections generally garner votes in name of caste and religion to provide them reservation in return after winning the elections. Example: Lingayats in Karnataka, Patidar Community in Gujarat, Marathas in Maharashtra.

- The apex court held that the reservation is not a matter of right but should be purely based on quantifiable data (Nagaraj Judgment) to prove the backwardness of the SC/ST community. The rationalization of reservation would not only ensure meritocracy but help India to ensure equitable growth to achieve new heights.





## **General Studies - 3**

(Technology, Economic Development, Biodiversity,  
Security & Disaster Management)

# DEEPFAKES

## WHAT IS DEEPFAKES? THE EFFECT OF DEEPFAKES.

*This article covers “Daily current events “ and the topic is ‘Deepfakes technology’ which is in news, It covers “ Science and Technology” In GS-3, and the following content has relevance for UPSC.*

**For prelims:** Deep fake, Cyber Security, Artificial Intelligence

**For mains:** GS -3, Challenges associated with deep fake Technology

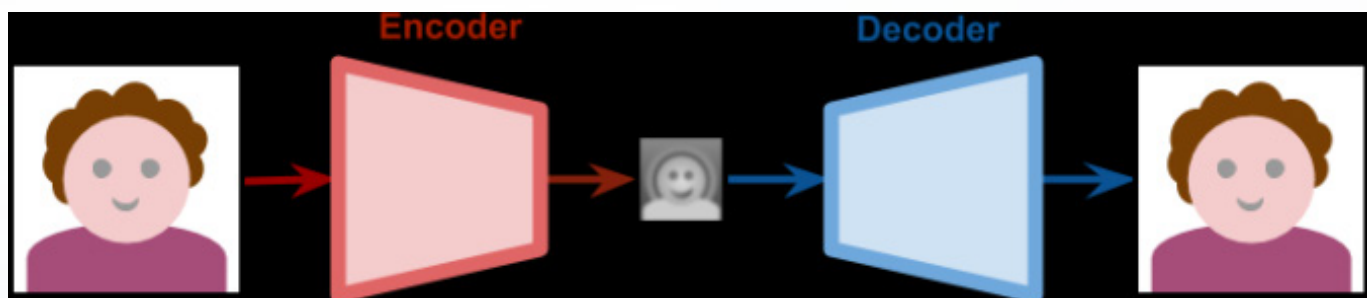
## ABOUT DEEPFAKES

- Digital media such as video, audio, and photographs that have been artificially intelligently edited and manipulated are known as deep fakes.
- In essence, it is a hyper-realistic computer fabrication. Deepfakes are made to hurt people and organizations. A perfect storm has formed to democratize the production and manipulation of media thanks to the availability of commodity cloud computing, open-source.
- AI algorithms, copious data, and enormous media. Deepfakes are the name for this fake media content. The ease with which false information, celebrity pornography, etc. are distributed online has attracted attention.
- It creates a fake version of authentic or original audio-visual content by overlaying fresh audio or visuals on top of an already-existing media file.
- The number of deep fake movies online has nearly tripled in just nine months when the AI Company Deep trace found 15,000 of them in September 2019. Surprisingly, 96% of them were pornographic, and 99% of them resembled renowned women's faces more than porn stars.

## ITS WORKING PROCESS

- The generator and discriminator, two AI algorithms that compete with one another, are used to produce deep false content.
- The discriminator's job is to determine if the bogus multimedia content generated by the generator is fabricated or real.
- Together, the generator and discriminator form a generative adversarial network (GAN). Every time the discriminator correctly identifies the false material, it provides the generator with crucial information about how to improve the following deep fakes.

- Establishing a GAN begins with determining the intended output and producing a training dataset for the generator.
- When the generator's output starts to reach an acceptable level, video clips can be fed into the discriminator.



DeepFakes

### MAJOR VICTIM:

- Deepfake's first instance of malevolent use was discovered in porn. Sensity.ai reports that over 135 million people have viewed sexual movies, accounting for 96% of deep fakes. Deepfake pornography only appeals to females. Threatening, intimidating, and psychologically damaging pornographic deepfakes are all possible. It turns women into sexual objects, which causes mental distress, and can also have indirect effects like job loss and financial loss.
- Deepfake can make someone appear to engage in deviant conduct and say deplorable things that they never would have. Even if the victim was able to disprove the hoax using an alibi or another method, the damage may have been done by that point.
- A malevolent nation-state might use Deepfake as a potent instrument to compromise public safety, sow doubt and turmoil in the target nation, and further its own agenda. Trust in institutions and diplomacy can be damaged by deep fakes.
- Non-state actors, such as insurgent groups and terrorist organizations, might utilize deep fakes to portray their enemies as making inflammatory comments or acting provocatively in order to incite anti-state feelings among the populace.
- Another issue with deepfakes is the liar's dividend, in which an unfavorable reality is discounted as fake news or deepfake. Deepfakes themselves provide more weight to denials than they otherwise would.
- Deep fakes, fake news, and alternative facts can all be used as weapons by leaders to attack legitimate media and the truth.

### **CONCERNS OF DEEP FAKE:**

- The financial system as a whole is affected by Deepfake's financial fraud.
- In the age of fake news, the security of cyber networks and the reliability of online information are also in jeopardy.
- People would find it harder to recognize a hoax if phishing attempts included deep fakes.
- Deep fakes can be used in any country to undermine democratic processes like elections.
- Since it may be used to create fake pornographic videos and make politicians appear to say things they did not, there is a significant potential for harm to individuals, groups, and societies.
- Because deep fakes are so common, the public is so skeptical that any legitimate evidence of a crime can be easily dismissed as false.
- As new technology makes it possible for unskilled individuals to produce sophisticated fakes using only a few photographs, fake movies are likely to grow in popularity outside of the world of superstars. This will encourage the development of revenge porn.
- In cybercrime, the use of false identities and imposter fraud is on the rise.
- Issues with authenticity and credibility: It is harder to tell whether videos are authentic or not when there are profound fakes present.

### **ADVANTAGES OF DEEPFAKE:**

- GANs can be used to generate fictional medical images, which can be used to train illness detection algorithms for rare diseases and to assuage patient privacy concerns.
- The drive for accessibility to increase equity can be sped up with Deepfake.
- The discriminator gets better at identifying fake video clips as the generator gets better at creating them. As the discriminator gets better at spotting fake videos, the generator, on the other hand, gets better at creating them.
- Artificial general intelligence (AGI), which is currently under research, will enable artificial intelligence to reason more effectively in the future.
- Exhibits in galleries and museums can be animated by deepfake films.
- In instructional videos, AI avatars can be created utilizing deep-fakes technology.
- Startups like London-based Synthesia have been attracting more attention from the



business sector as real-people video productions have become much more difficult to pull off due to lockdowns and health issues.

- Along with being utilized for entertainment and education, deepfake technology may be used to create custom avatars for each user.
- Uncomplicated identity protection For instance, in news coverage about the discrimination against LGBTQ people in Russia, interviewees' identities have been protected by AI-generated avatars.
- Using high-resolution deep fakes face-swapping technology, Disney has improved their visual effects as deep fakes technology continues to evolve.

#### **WAY AHEAD:**

- As media consumers, we must be able to decipher, understand, translate, and use the information we encounter.
- Meaningful regulations created in collaboration with the technology industry, civil society, and the government can aid in preventing the creation and spread of malicious deep fakes.
- Deep fakes pose risks to the government, society, economy, culture, and local communities, which should be known by policymakers.
- Prior to resolving the issues deep fakes present, media literacy needs to be improved.
- The only method to deal with this problem is with technical solutions supported by artificial intelligence that can recognize and block deep fakes.
- Blockchains can be used to digitally sign and validate a video's or document's authenticity because they are resistant to a variety of security issues.

## Financial Stability Report: by RBI

*This article covers "Daily current events" and the topic is about the "Financial stability report" which is in news. It covers "Indian Economy and related issues" In GS-3, and the following content has relevance for UPSC.*

**For prelims:** About Financial stability report

**For mains:** GS -3, Indian Economy and related issues

### WHY IN NEWS:

Recently, RBI released financial stability report.

### MAJOR FINDINGS OF THE FINANCIAL STABILITY REPORT

- Prospects for the world economy: Due to the European conflict, the front-loaded normalization of monetary policy by central banks in reaction to chronically rising inflation, and the several COVID-19 pandemic waves, it is veiled in a great deal of uncertainty.
- A route to recovery: The Indian economy is still recovering despite the difficulties caused by global spillovers, but inflationary pressures, foreign spillovers, and geopolitical threats need to be handled carefully and closely watched.
- Capital buffers: Financial institutions, including banks and non-banking, have enough capital buffers to withstand shocks.
- Scheduled Commercial Banks' (SCBs') capital-to-risk-weighted assets ratio (CRAR) increased to a new high of 16.7% while their gross non-performing asset (GNPA) ratio dropped to a six-year low of 5.9% in March 2022. Banks now have the resources necessary to write off the majority of their problematic loans thanks to several waves of recapitalization.

Even more significantly, NPAs for industrial lending has dropped from 23% to 8.4%.

Even with these significant write-offs, the majority of banks still have adequate capital.

- Macro stress testing for credit risk has shown that SCBs would be able to meet the minimum capital requirements even under very stressful circumstances.

### CONCERNS

- Broad averages mask a troubling picture, raising concerns about how bank credit will sustain GDP growth.

- The issue is that not much of this credit is being used to finance investments or large-scale industries.
- Reduced bank credit: Banks have gradually turned away from lending to industry over the past ten years in favor of lending to households.
- As a result, consumer loans have climbed from 19% to 29% of total banking credit, while the share of industry credit has decreased from 43% in 2010 to 30% in 2020.
- High NPA concentrations: Within a short period of time, credit doubled, largely as a result of funding for significant infrastructure projects.
- Many of those loans later went bad, resulting in significant NPAs on bank balance sheets.
- Further basic issues: As of yet, there is no framework in place to lessen the risk associated with private sector investments in infrastructure, especially not in the crucial and seriously problematic power industry.

#### **WAY AHEAD:**

- The financial system received a largely unblemished report card from the report.
- Given the strain of the previous ten years, the pandemic's shock, and the ensuing economic slump, this performance is noteworthy.
- The improvement in banks' financials is a "glass half-full" scenario, nevertheless.
- It is yet unknown if the financial sector is strong enough to support the steady rise in credit required for a robust economic recovery.
- The financial sector's reach has been aided by technology, and its advantages must be fully realized.

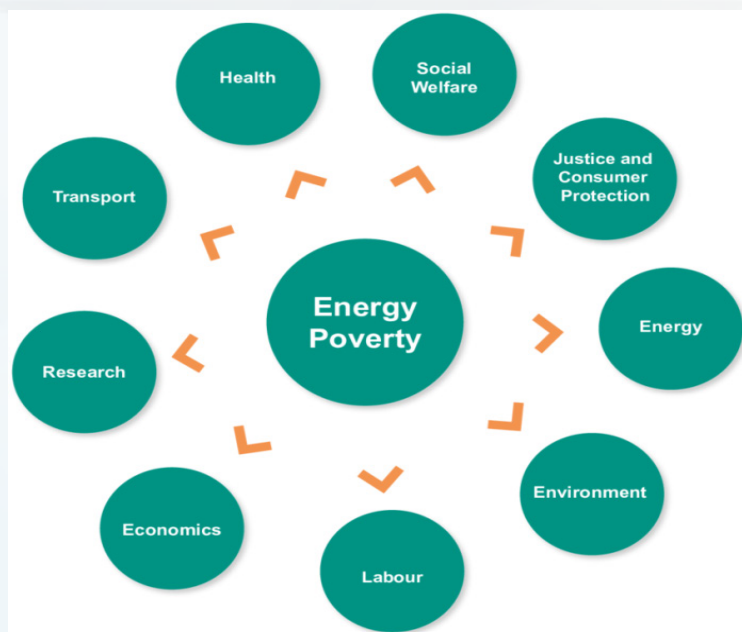
# Energy Poverty

## ENERGY POVERTY AND ITS DETAILS

*Energy Poverty means a lack of access to sustainable modern energy products and services. Given the fact that energy and human development are proportionately linked, it is of utmost importance that sustainable Energy Poverty means a lack of access to sustainable modern energy products and services.*

## FACTORS CAUSING ENERGY POVERTY IN INDIA

- Inadequate Energy Infrastructure: India has more relied on traditional biomass such as wood, crop residue, and wood pellets. Lack of energy infrastructure such as underground pipelines,
- and transmission lines created hurdles
- The inefficiency of Energy: High losses during transmission, and energy thefts lead to inefficiency.
- Dependency and Vulnerability: The majority of electricity produced in India is created through coal which in general is imported due to poor reserves. In event of war and geopolitical
- tensions, the price of coal has soared more than 200% which makes electricity, a luxury.
- To make India achieve self-reliance in sustainable energy production, the government has taken several steps.



Energy Poverty



## **STEPS WERE TAKEN BY THE GOVERNMENT TO ENSURE ENERGY SECURITY**

- National Solar Mission: Solar Power has increased almost 10 times with help of schemes like the Solar Park scheme, Canal Bank Scheme, Grid connected solar rooftop scheme
- National Biofuel Policy: Biofuel could be easily sourced and could decrease India's dependency on crude oil Which will further ensure India's energy integrity.
- UJALA (Unnat Jyoti by Affordable LEDs for All): Under UJALA, the government has distributed 37 crore LED bulbs across the country resulting in energy savings of 47.65 billion kWh per year and decreased estimated Greenhouse Gas (GHG) emission of 38.59 million tonnes of CO<sub>2</sub> per year.
- In order to ensure India's energy security and uplift India from energy poverty, the government needs to organize an awareness campaign related to subsidies. The government should also set up monitoring mechanisms to ensure the implementation in the true spirit of the letter.

## Domestic systemically Important Bank: (D-SIBs)

*This article covers “Daily current events “and the topic is ‘Domestic systemically important banks (D-SIBs)’ which is in news, it covers “banking sector and NBFCs” In GS-3, and the following content has relevance for UPSC.*

**For prelims:** about D-SIBs Banks

**For mains:** GS -3, Indian economy, banking sector

### WHY IN NEWS:

- SBI, ICICI Bank, and HDFC Bank are identified by RBI as Systemically Important Banks.
- According to the RBI circular, SBI, which is put in bucket 3, would need to make a provision of 0.60% toward increased Common Equity Tier 1(CET1) requirements as a percentage of Risk Weighted Assets, compared to ICICI Bank and HDFC Bank, which are placed in bucket 1.

### ABOUT

- Systemically Important Banks (SIBs): Some banks acquire this status as a result of their scale, cross-border operations, complexity, lack of substitutability, and inter-connection.
- The idea of SIBs being “Too Big To Fail (TBTF)” banks is prevalent. Since these banks are perceived to be TBTF, people anticipate government assistance when they are in trouble.
- The systemic dangers and moral hazard issues that SIBs present are addressed by additional governmental measures.
- The risk connected to the breakdown or collapse of a business, sector, financial institution, or entire economy is known as systemic risk.
- A moral hazard occurs when one party participates in a risky activity while aware that it is protected from the risk and the other party will bear the expense.
- The critical services that these banks provide to the banking system, as well as the broader economic activity, could be seriously disrupted by the uncontrolled failure of these banks.

## **BACKGROUND OF D-SIBs**

### **G-SIBs:**

- Global Systemically Important Banks (G-SIBs) have been identified since 2011 by the Financial Stability Board (FSB), in collaboration with the Basel Committee on Banking Supervision (BCBS) and national authorities.
- An international organization known as the Financial Stability Board (FSB) keeps an eye on the world financial system and offers suggestions. It was founded in 2009. A member in India.
- The evaluation and identification process for G-SIBs is published by BCBS.
- The principal international standard setter for the prudential regulation of banks is BCBS. Its member is RBI.

### **G-SIIs:**

- The FSB started classifying Global Systemically Important Insurers (G-SIIs) in 2013 after consulting with national regulators, the International Association of Insurance Supervisors (IAIS), and the IAIS.
- IAIS, founded in 1994, is an organization of insurance supervisors and regulators from more than 200 nations, accounting for 97% of global insurance premiums. Membership is voluntary.
- The International Financial Services Centers Authority (IFSCRA) and the Insurance Regulatory and Development Authority of India (IRDAI) are its members.

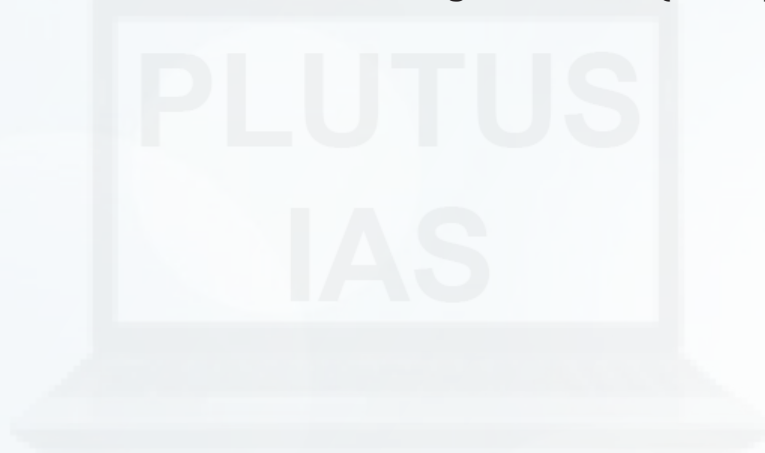
## **DOMESTIC SYSTEMICALLY IMPORTANT BANKS (D-SIBs)**

- In October 2012, the BCBS published a final version of its framework for handling D-SIBs. The D-SIB approach focuses on how the domestic economy will be affected if banks experience trouble or fail.
- In contrast to the G-SIB framework, the D-SIB framework is founded on the evaluation made by the national authorities, who are best qualified to assess the effects of failure on the local financial system and the local economy.
- In 2014, the RBI released the guidelines for handling D-SIB. Starting in 2015, the Reserve Bank is required by the D-SIB framework to reveal the names of banks that have been designated as D-SIBs and classify those banks into the relevant buckets based on their Systemic Importance Scores (SISs).

## INDICATORS USED

- Size, connectivity, substitutability, and complexity are the indicators that are employed for evaluation.
- The additional Common Equity Tier 1 Capital (CET1) requirements for banks range from 0.20 to 0.80 percent of risk-weighted assets and are based on their systemic relevance scores, which are plotted into four buckets in descending order (RWA).
- As it absorbs losses as soon as they happen, CET1 is the greatest quality of regulatory capital. As a preventative step to safeguard the economy from a financial catastrophe, it is a capital measure that was imposed globally in 2014.
- RWA is used to correlate the minimum capital requirements for banks with the risk profile of the bank's lending activity (and other assets).

If a foreign bank with branch locations in India is deemed to be a Global Systemically Important Bank (G-SIB), it is required to maintain additional CET1 capital surcharges in India that are commensurate to its Risk Weighted Assets (RWAs) in India.





## Future perspective of Metaverse and artificial intelligence

*This article covers “Daily current events” and the topic is about ‘Metaverse and artificial intelligence’ which is in news, it covers the “scientific innovations and discoveries” In GS-3, and the following content has relevance for UPSC.*

**For Prelims:** Artificial intelligence, facts about Metaverse, Chatbots, and types

**For Mains:** GS-3, GS- 4, Significance of Artificial intelligence and Metaverse, ethical concerns associated with it.

### WHY IN NEWS:

Although 2022 wasn't the best year for IT companies, new technologies related to the Metaverse and AI (Artificial Intelligence) may develop in the future and bring both opportunities and challenges.

Many of the changes in demand that occurred during and after the Covid-induced lockdowns were visible in 2022.

Near chaos in the majority of Silicon Valley businesses, particularly those in the internet industry, marked the end of 2022.

The following 4 developments make metaverse a strategic technology trend:

- Web3, a fresh set of technologies for creating decentralized web apps that give users authority over their own identity and data, is the first innovation. When the value is shared in some way between individuals, groups of people, or both, Web3 and the metaverse work best together.
- Spatial computing, which is a three-tiered technological stack that enables users to interact with the nexus of the real and digital worlds, is the second innovation.
- The third innovation is the digital twin of a person (DToP), which not only replicates an individual but also enables near-real-time synchronized multipresence, or the capacity to be present in several locations simultaneously in both digital and physical settings.
- The fourth innovation is a digital twin of a customer (DToC), a subclass of DToP, which simulates, learns to imitate, and anticipates behavior. Customers can be specific persons, character types, social groups, or even machines.

### OPPORTUNITIES AND CHALLENGES OF META-AI ABOUT TO FACE

#### INCREASED AI PERVASIVENESS:

- ChatGPT has demonstrated to the world that conversational AI is a concept whose

time has come.

- In addition to being able to “admit its mistakes, challenge false premises, and refuse unsuitable requests,” the ChatGPT can also “answer follow-up inquiries.” However, the majority of these AI components are now found in independent products, which makes them more of a toy than a useful tool.
- This intelligence will be seen incorporated into more daily-used products by 2023, such as Gmail, which will not only auto-suggest but also write the next email to the concerned person.

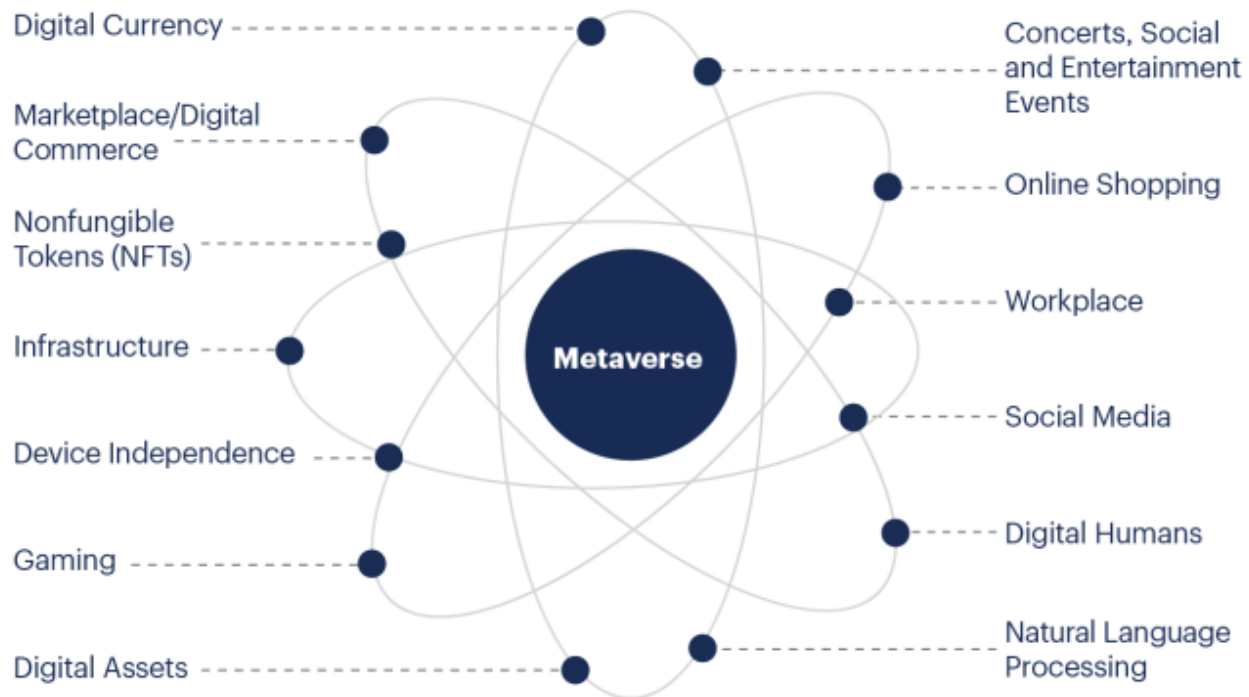
#### **FURTHER THAN SOCIAL MEDIA:**

- With an audience that is getting younger and more digitally native, Twitter and Facebook are fighting to stay relevant. Their ideas of social interaction are significantly dissimilar, frequently lacking text and noticeboard actions.
- For instance, Meta intends to be the social connection when users, if any, move to the Metaverse and are aware that it will need to go beyond its current social media platforms.
- But there’s a chance that won’t change anytime soon. The social media arena appears to be developing a gap until then, which is being filled for the time being by users who only post brief videos. But that fad will pass, and not all platforms perform well in that market.

#### **GREATER REGIONAL, DARKER SOCIAL BUBBLES:**

- The Internet is getting more multilingual and regional as it grows in popularity, especially in developing nations like India.
- The availability of smaller, regional languages is becoming more of a concern for platforms like Google as the English-language internet appears to have reached a plateau worldwide.
- In addition to being a technical challenge, this offers a chance to test out cutting-edge innovations that can automatically adapt online material for these new users.

# Elements of a Metaverse



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Elements of a Metaverse

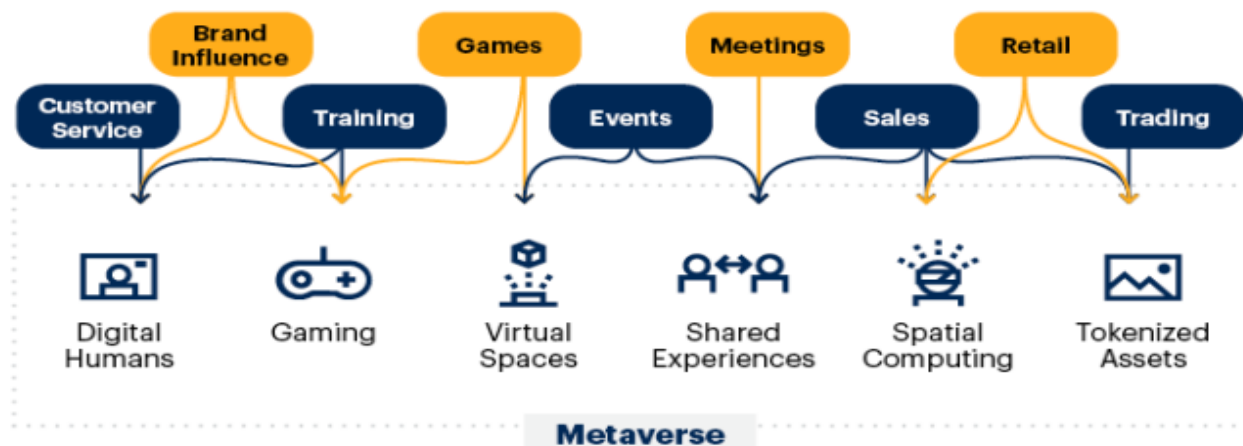
## FUTURE OF METAVERSE

- Extended reality (XR) may be the solution for virtual collaboration and communication as hybrid workforces become the norm and travel is still not as convenient as it once was.
- A new word called "XR" is being used to refer to all immersive technologies, including augmented reality (AR), virtual reality (VR), mixed reality (MR), and future developments.
- By fusing the virtual and "real" worlds together or by generating a completely immersive experience, all immersive technologies expand the reality we experience.
- It may be up to businesses to provide headsets and other equipment to their staff

for regular XR meetings as these virtual interaction tools are currently highly pricey.

- The initial implementation of this would resemble an improved form of video conferencing with the addition of interaction with virtual objects.
- Regular users of the Metaverse should have access to a few more commercial versions this year. The difficulty will be in creating hardware that allows access to these virtual worlds without driving users into financial ruin. A cheap gadget that makes it simple for consumers to log into the Metaverse could be the major disruptor; it might even be a smartphone.

## Opportunities in a Metaverse (Now and in the Future)



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Opportunities in a Metaverse

### CURRENT APPLICATIONS

- E-commerce: By bridging the gap between the real world and the virtual one, it can combine online and offline trade. This implies that consumers will be able to virtually experience the real world through the metaverse, making online buying more practical.
- Businesses would gain a lot from this technology because it has the potential to increase their customer base and provide feedback on new items, guiding them in the



right way for the future.

- Despite geographical constraints, brands can engage with a worldwide audience through Metaverse in an online business framework.
- Enhancing Skills: Because of its potential for creating novel experiential learning scenarios, metaverse has the potential to significantly contribute to skill enhancement remotely.
- Virtual tourism: With the 360° virtual tour, viewers can virtually visit the selected destination in addition to seeing it being recorded there with lifelike effects.
- For instance, the “Try before you Fly” virtual reality vacation program enables would-be travelers to virtually travel to their favorite locations.
- Education & Learning: The benefits of this technology in combination with VR have elevated the learning experience to a new, high standard. Enhanced and superior information materials are now available for students to use while watching live experiments.
- Microsoft’s Mesh, a mixed-reality platform where instructors, staff, and students can interact with their 3D avatars, is another example of the Metaverse.
- Healthcare: Patients and doctors can communicate in virtual, three-dimensional clinics thanks to the telemedicine and telehealth concept, which was inspired by the pandemic in the Metaverse.

#### **AI-RELATED ETHICAL CONCERNS:**

- Privacy and surveillance, bias or discrimination, and maybe the philosophical problem of the function of human judgment are some of the legal and ethical problems that AI brings to society. As a result of its use, worries have been raised about more recent digital technologies becoming a new source of inaccuracy and data breaches.
- The socio-political and economic ramifications of AI are raising concerns, and these worries about the coexistence of these developing technologies and fundamental elements of contemporary democracies represent the other side of this technological revolution.
- As a result, the deployment of AI responsibly and safely is moving to the forefront of the technological revolution.
- In India, constitutional morality was intended to serve as the foundation for AI ethics, elevating our constitutional rights and ethos to the position of prime importance for the responsible use of AI.

## **PRINCIPLES OF RESPONSIBLE AI:**

- **Safety and Reliability:** AI systems need to be reliable for their intended purposes and have built-in security measures to protect stakeholders.
- **Equality:** When developing AI systems, it is important to keep in mind that similar persons in similar situations should be treated equally.
- **Principle of Transparency:** An AI system's design and training are essential to its operation. To guarantee that the deployment of the AI system is objective, accountable, and devoid of prejudice or inaccuracies, the system must be audited and capable of external examination.
- **Principle of Responsibility:** Because there are many parties involved in creating, implementing, and using an AI system, the accountability structures for any negative impacts, harms, or damages caused by the AI system must be spelled out in a way that is easily accessible to the general public.
- **Protection and Upholding of Positive Human Values:** This principle is concerned with the potential negative consequences of AI systems through the collection of personal information for profiling and the usage of AI systems in ways that violate fundamental rights.
- **Inclusion and Non-Discrimination:** AI systems must be built to be inclusive of all stakeholders and must not discriminate by bias between stakeholders on issues of education, employment, access to public areas, etc. based on religion, race, caste, sex, descent, place of birth, or domicile.
- **AI systems must ensure that data subjects' personal information is secure and protected so that only authorized individuals can access it for the purposes that have been identified as being essential. This must be done within a framework that provides enough protection to ensure the process.**

## **WAY AHEAD:**

- **Reducing the Digital Divide:** In order for participants to engage meaningfully in online communities while consciously navigating harmful content and behaviors, governance mechanisms for virtual worlds would need to be supported with strengthening and scaling efforts to promote digital literacy, safety, and wellbeing.
- **Policy Support:** The government should now develop the best possible policy framework to support its operations and use the metaverse to provide public services.
- **Information accessibility, information use, and information receptivity must be the government's main concerns.**
- **Secure and Safe Metaverse Ecosystem:** To handle the unique features of safety, pri-

vacy, and security inside the DNA of this technology, effective ecosystems must be developed and regulated.

- To overcome any potential legal obstacles, the development of a citizen-friendly meta-governance infrastructure will require the cooperation of specialists from diverse fields, including designers, business model experts, and attorneys. It can also be necessary to include the private sector.
- Global Cooperation: We are catching a glimpse of a more technologically advanced, borderless society full of promise as the metaverse continues to grow.
- While this new world is still expanding, we need to be mindful of the issues it poses with each new development and anticipate universally enforceable laws.
- ICT is used in e-governance to distribute critical information to a specific audience. The necessary vital data can be supplied by meta-help desks or meta-divisions within a certain ministry or by other government organizations.
- Applications with open and informed consent: The data processing and safety practices used by technology corporations will need to be more accountable and open.
- To avoid unregulated data processing and collection for commercial advantage, it will be crucial to promote an informed consent-based approach while collecting personal data and adhere to the principles of data minimization and purpose limitation.

# National Hydrogen Mission

*This article covers “Daily current events “and the topic is “The national hydrogen mission’ which is in news, it covers the “Infrastructure and energy sector of India” In GS-3, and the following content has relevance for UPSC.*

**For prelims:** Facts about green hydrogen and different types of hydrogen.

**For mains:** GS-3, infrastructures from the Indian economy, about the green hydrogen mission

## WHY IN NEWS:

- India's Rs 20,000 crore National Green Hydrogen Mission has been authorized by the Union Cabinet, which is presided over by the Prime Minister (NGHM).
- The National Hydrogen Mission (NHM), which the finance minister outlined in the Union Budget for 2021–2022, includes NGHM.
- On the occasion of India's 75th Independence Day, the Indian Prime Minister also unveiled the National Hydrogen Mission.

## AIM AND OBJECTIVE OF NATIONAL HYDROGEN MISSION

- Making India a major hub for the production and export of green hydrogen is one of the goals.
- In order to satisfy India's Nationally Determined Contributions, we must harness green hydrogen energy (NDCs).

**HYDROGEN:** hydrogen is the first chemical element.

Since it makes up around 75% of all ordinary matter, hydrogen is both the universe's lightest element and its most prevalent.

- With the chemical symbol H and atomic number 1st chemical.
- It has no flavour, no aroma, no colour, is non-toxic, and is highly flammable.
- When burned with oxygen, hydrogen fuel produces no emissions. It can be utilised as a propulsion fuel for spaceships as well as in internal combustion engines and fuel cells.

Hydrogen

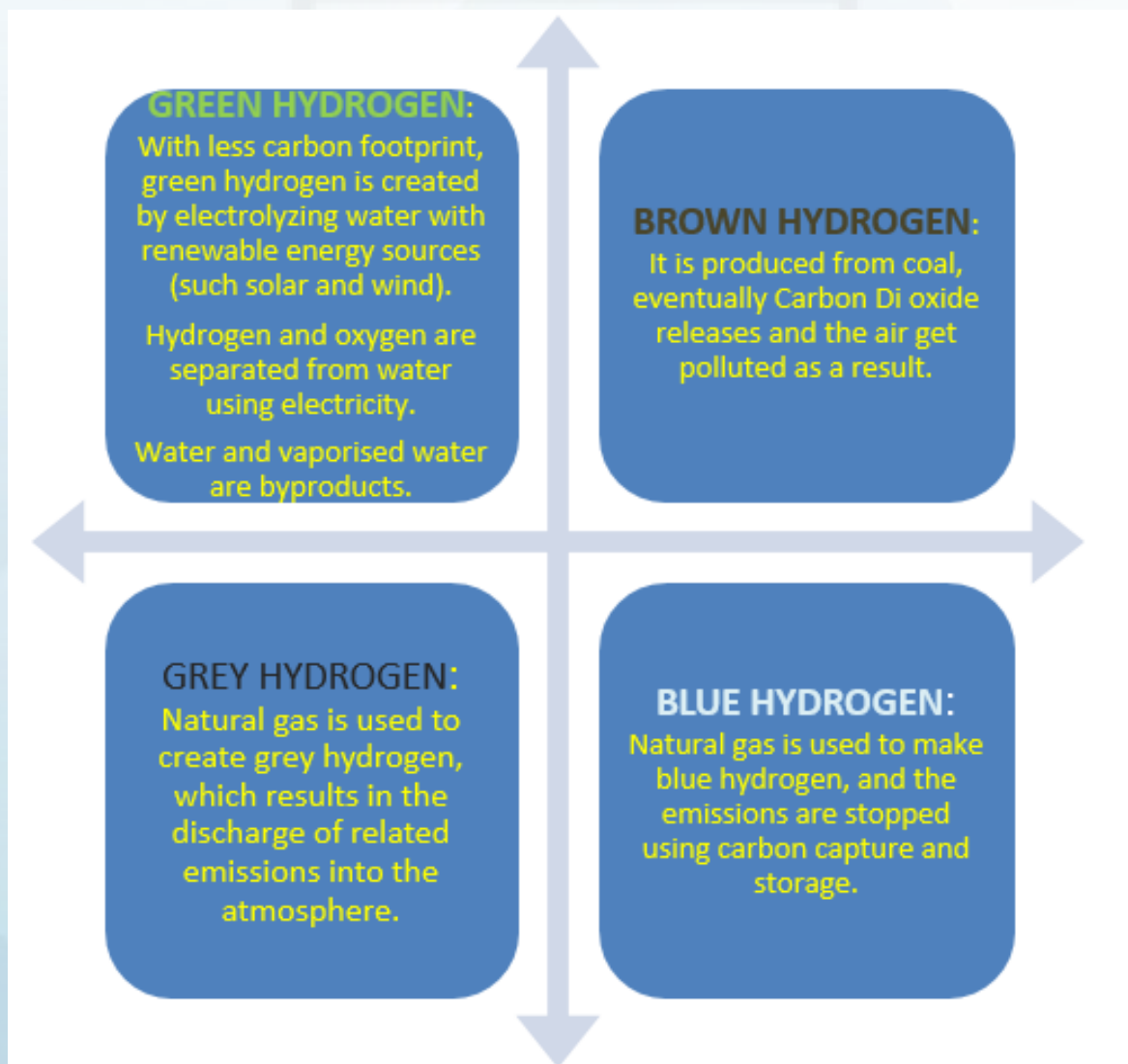


## ABOUT GREEN HYDROGEN

- A crucial industrial fuel, hydrogen is used to create steel, electricity, and ammonia, a crucial fertilizer, among other things.
- Green hydrogen is created when water is electrolyzed to separate into hydrogen and oxygen using electricity produced using renewable energy sources like solar or wind. This method of creating hydrogen is the most eco-friendly.

## EXTRACTION:

- The element hydrogen coexists with other elements.
- This means that in order to use it as a source of energy, it must be extracted from naturally existing substances like water (which is a combination of two hydrogen atoms and one oxygen atom).
- Different colors represent different categories of hydrogen's sources and production methods.



## TYPES OF HYDROGEN

### OTHER COLOURS OF HYDROGEN



#### Black hydrogen

Bituminous coal is used to make Black hydrogen



#### Red hydrogen

Biomass is used to make Red hydrogen



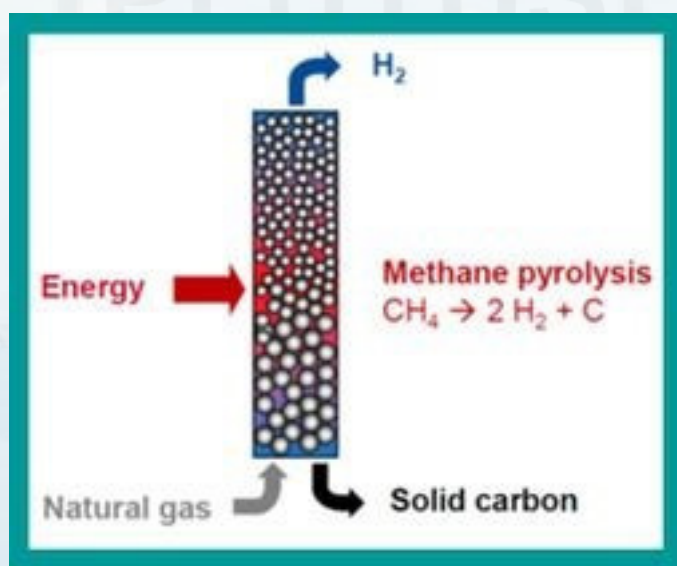
#### Pink hydrogen

- Nuclear power is used to make Pink hydrogen.



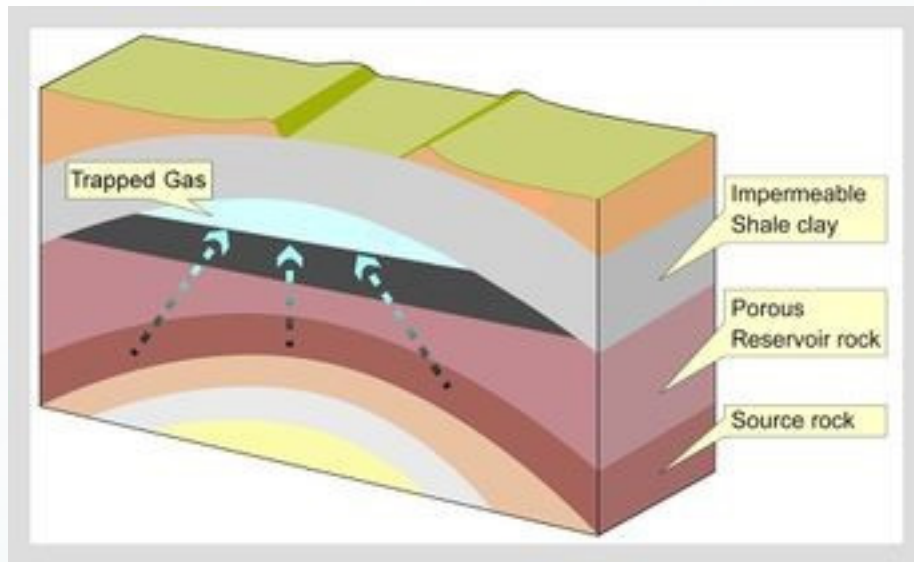
### Yellow hydrogen

- Solar power or a mix of energy sources from the electrical grid is used to make Yellow hydrogen.



### Turquoise hydrogen

- Methane pyrolysis is used to make Turquoise hydrogen



### White hydrogen

- Naturally occurring geological hydrogen is called White hydrogen.

### KEY ELEMENTS

- The scheme implementation guidelines for the individual components will be developed by the Ministry of New and Renewable Energy (MNRE).
- Production, use, and export of green hydrogen will all be facilitated by the NGHM.
- Pilot initiatives in developing end-use industries and supply chains will also be supported by the Mission.
- The creation of the Green Hydrogen ecosystem will be aided by the creation of an enabling policy framework.
- The Mission will enable the development of a framework for public-private partnerships in R&D. To create technologies that are competitive on a worldwide scale, R&D initiatives will be goal-oriented, time-bound, and appropriately scaled up.

### HOW WOULD THE NATIONAL HYDROGEN MISSION AID IN THE GENERATION OF GREEN HYDROGEN

- According to the Ministry for New and Renewable Energy, the Mission would “enable demand generation, production, utilization, and export of Green Hydrogen.”
- The program is divided into two umbrella sub-missions.
- Strategic Interventions for Green Hydrogen Transition Programme (SIGHT), which will provide funding for household electrolyzer production and green hydrogen.



- Green hydrogen hub: The second is supported by pilot projects in newly emerging end-use markets and distribution networks. We will identify and create “Green Hydrogen Hubs” in states and regions that can support large-scale hydrogen production and/or use.

### **CONCERNS ASSOCIATED**

- India will face competition from the roughly 500 hydrogen stations that are currently operational worldwide, most of which are in Europe, followed by Japan and South Korea. This is due to a lack of fuel station infrastructure.
- The method of producing hydrogen is energy-intensive and is still in its infancy. A lot of energy is needed to split methane or water. In addition, the current cost of the process is high.
- High R&D investment is needed for the newer technology to make the process affordable, workable, and scalable.
- the number of regulatory agencies: Red tape in government operations is brought on by the involvement of numerous Ministries and Departments.
- Risks related to the transportation of hydrogen: Because hydrogen is very combustible and challenging to move around, safety is the first priority.

### **ADVANTAGES:**

- Positive aspects of green hydrogen.
- The development of green hydrogen export opportunities.
- Decarbonization of the transportation, industrial, and energy sectors
- Being independent decreases reliance on imported feedstock and fossil fuels.
- For India, made in India: building up domestic manufacturing capacity
- The creation of job opportunities.
- Creation of innovative technologies.

### **SIGNIFICANCE:**

- RE Capacity Enhancement: Establish a green hydrogen generation capability of at least 5 MMT (million metric tonnes) annually.
- a country-wide increase in associated renewable energy capacity of roughly 125 GW
- Boost up the investment

- More employment generation.
- Imports of fossil fuels have been reduced overall.
- Almost 50 MMT of annual greenhouse gas emissions must be reduced in order for the government to fulfill its COP 26 obligations.
- The best zero-emission solutions are those like this one. With only water-related tailpipe emissions, it is fully eco-friendly.
- Reduce emissions: emission into the atmosphere of gas or radiation, for example.
- Limited operation Because of how quiet the fuel cells are, they can be employed in tough environments like hospital buildings.

#### **WAY AHEAD:**

- Alternatives that Reduce Emissions: Another option that several hydrogen councils are advocating for is “blue” hydrogen, which is grey hydrogen combined with additional installations for carbon capture and storage built within the manufacturing facility.
- National Hydrogen Mission (NHM) will see to it that the world’s and India’s clean energy supply chains are integrated.
- The success of NHM depends on interministerial and departmental coordination.
- NHM will make India a global leader in clean hydrogen energy and will ensure that the country’s aim of being carbon neutral is achieved.

## Sweet Revolution & Honey Mission

*This article covers “Daily current events “and the topic is about the ‘Sweet Revolution or honey mission’ which is in news, it covers “Agriculture marketing” In GS-3, and the following content has relevance for UPSC.*

**For prelims:** Facts National Beekeeping mission, Sweet revolution

**For mains:** Doubling farmers’ income, Honey mission

### WHY IN NEWS:

- The Khadi and Village Industries Commission (KVIC), after offering beekeeping instruction to 17 thousand 500 beneficiaries throughout the nation as part of the Honey Mission, has so far distributed 1 lakh and 75,000 bee boxes.
- The top ten states for honey production in 2021–2022, according to the National Horticulture Board (NHB), were Uttar Pradesh, West Bengal, Punjab, Bihar, Rajasthan, Himachal Pradesh, Haryana, Uttarakhand, Madhya Pradesh, and Karnataka.

### ABOUT HONEY MISSION:

- Under the Ministry of MSME, the Khadi & Village Industries Commission (KVIC) launched the Honey Mission programme in 2017–18.
- It is currently being implemented to promote beekeeping activities and offer self-sustaining employment opportunities among farmers, Adivasis, and unemployed youth in rural India, particularly in economically depressed and remote areas.
- Beneficiaries of the initiative receive tool kits, training, live bee colonies, bee boxes, and beekeeping equipment.
- Additionally, the Ministry of MSME’s “A Scheme of Fund for Regeneration of Traditional Industries” (SFURTI) programme gives traditional beekeepers a stable source of income by grouping them into clusters and providing them with modern equipment and training. The programme has authorised 29 honey clusters.

### ABOUT SWEET REVOLUTION

- The Government of India has launched a significant drive to promote apiculture, also referred to as “beekeeping.”
- The National Beekeeping and Honey Mission, a central sector programme run by the Ministry of Agriculture and Farmers Welfare, was introduced by the government in 2020 as part of the AtmaNirbhar Bharat programme to give Sweet Revolution a boost.



Sweet Revolution

## AIM

- It seeks to quicken the production of high-quality honey and associated goods.
- Since honey is regarded as a naturally healthful commodity, demand for high-quality honey has increased throughout time.
- Royal jelly, beeswax, pollens, and other apiculture products are also widely employed in a variety of industries, including pharmaceuticals, food, beverage, beauty products, and others.

## INDIAN PRODUCTION

- India's production and export of honey began in 1996–1997, when it began its first formal exports.
- India currently exports more than 80% of its natural honey to the United States, which is the country that receives the majority of this trade.
- During 2020–21, India exported 59,999 metric tonnes (MT) of natural honey for a total value of Rs. 716 crore (US \$ 96.77 million), with the United States accounting for the lion's share at 44,881 MT. Canada, Bangladesh, Saudi Arabia, and the United Arab Emirates were the other leading foreign markets for Indian honey.
- The main regions for the nation's production of natural honey are the North East Region and Maharashtra. In India, around half of the honey produced is consumed locally, and the other half is shipped outside.
- Exporting honey has enormous potential, particularly in the COVID-19 pandemic given the rise in its consumption as a more healthy alternative to sugar and an efficient



immune booster on a worldwide scale.

## CONCERNS

<b>Domestic</b>	<ul style="list-style-type: none"><li>▪ Achieving need-based training and upskilling</li><li>▪ Finance and credit facilities education</li><li>▪ Increasing guidance on seasonal management and migration</li><li>▪ Knowledge of quality standards is necessary.</li><li>▪ Branding and market connections should be <u>formalised</u>.</li><li>▪ Integration of the cluster-based methodology and the current FPO building designs.</li></ul>
<b>Exports</b>	<ul style="list-style-type: none"><li>▪ Higher nuclear magnetic resonance test expenses Limited availability of containers during the busiest honey export season (used to test for adulterations and other manipulations)</li><li>▪ Insufficient incentives for exporting.</li><li>▪ Higher freight charges</li></ul>

## SIGNIFICANCE OF SWEET REVOLUTION

- By utilising technology, this mission will assure bee conservation, stop diseases or the loss of bee colonies, and deliver high-quality and plentiful apiculture goods.
- High-quality honey and other goods will be produced through farming practices for both the domestic and international markets.
- A low-investment, the highly-skilled business model is beekeeping, where technology use has become a key facilitator of socioeconomic development.
- Beekeeping expansion will quadruple farmers' revenue, create jobs, guarantee food security and bee conservation, and boost crop productivity.

## WAY AHEAD:

- Renegotiating the tax system imposed by different nations to increase honey exports
- Accessing government funding through various programmes, quality certification, and lab testing while assisting producers in accessing export markets
- Along with this, more should be done to address issues including increased freight prices, a shortage of containers during the busiest honey export season, increased expenses for nuclear magnetic resonance tests, and insufficient export incentives.
- Looking into newer honey export markets, such as the European Union, the United Kingdom, and South East Asia.

## Viologen-Unit Grafted Organic-Framework (iVOFm)

*This article covers “Daily current events “and the topic is ‘ Viologen–New material removes pollutant from water’ which is in news, it covers the “Environment” In GS-3, and the following content has relevance for UPSC.*

**For prelims:** Facts about newly discovered pollutants removing material

**For mains:** GS-3, Environment and pollution, water contaminants

### WHY IN NEWS:

Macro/microporous ionic organic framework, developed by researchers at the Indian Institute of Science Education and Research (IISER), Pune, is a specially engineered, one-of-a-kind molecular sponge-like substance that can quickly clean polluted water by soaking up harmful chemicals.

**About:** Water Contamination

Numerous organic pollutants, such as organic dyes, antibiotics, pesticides, etc., as well as inorganic toxic pollutants, like iodides, and oxo-pollutants, like perrhenate, that are carcinogenic in freshwater sources and can directly endanger people and living things have been identified through systematic studies.

### ABOUT THE MATERIAL: VIOLOGEN-UNIT GRAFTED ORGANIC-FRAMEWORK (IVOFM)

- Generally speaking, generally used sorbent materials frequently trap the contaminants through an ion exchange method to filter water, however, they have low kinetics and specificity.
- To address this problem, scientists have created a novel material they call viologen-unit grafted organic-framework (iVOFm).
- The substance uses a combination of ion exchange driven by electrostatics, nanopores, and particular binding sites for the contaminants being targeted.
- Water may be promptly cleaned of a variety of hazardous pollutants thanks to the size and quantity of tunable macropores and the potent electrostatic interaction with iVOFm.
- To create a sponge-like infinite framework out of a charged porous organic polymer (POP) using silica nanoparticles as a template, researchers adopted a make-and-break technique.
- The silica nanoparticles were then purposefully removed in order to uniformly establish macro/microporosity with ordered hierarchical connections throughout the

material.

### **RAPID DIFFUSION**

- To allow quick dispersion of contaminants, this material has a naturally cationic character and macroporosity.
- When tested for a variety of water pollutants, it demonstrated incredibly quick capture of all the pollutants—both organic and inorganic—removal rates of over 93% in just 30 seconds.
- Sulfadimethoxine antibiotics may be effectively removed by the developed material.
- Additionally, it can be used repeatedly to purify tainted water.



## Credit rating Agencies

*The article talks about how Credit Rating Agencies impact the Indian Economy*

**Relevance for Prelims:** Credit rating Agency, Implications of ratings

**Relevance for Mains:** Significance of CRA's

Recently, The Finance Secretary to the Union Government of India accused Credit Rating Agencies of double standards while assessing developing and emerging economies.

Sovereign Credit Ratings (SCR) are given on the relative ability and potential of the government to meet its financial commitments. i.e., the ability to service their debt. The ratings are issued by assessing overall economic and political stability which is extrapolated from the publicly available data and confidentially given by other currency banks regarding forex reserves and transparency in the market.

### REASONS FOR DIFFERING VIEWS BETWEEN GOVERNMENT AND CREDIT RATING AGENCIES

- Credit rating Agencies are of the view that India is one of the most indebted developing economies. It does not have any clarity on long-term fiscal consolidation and has fuelled growth with Budgetary Support. The Fiscal Deficit has been continuously deteriorating.
- On contrary, Government contends that it has a zero sovereign default history. Not only India has passed the recession but witnessed a V-shaped recovery. It has the fourth largest forex reserves in the world and at all times- high at \$ 640 Billion. The country ranked in World Ease of Doing Business at an unprecedented rate from 100 to the top 30.

### IMPACT OF POOR RATINGS

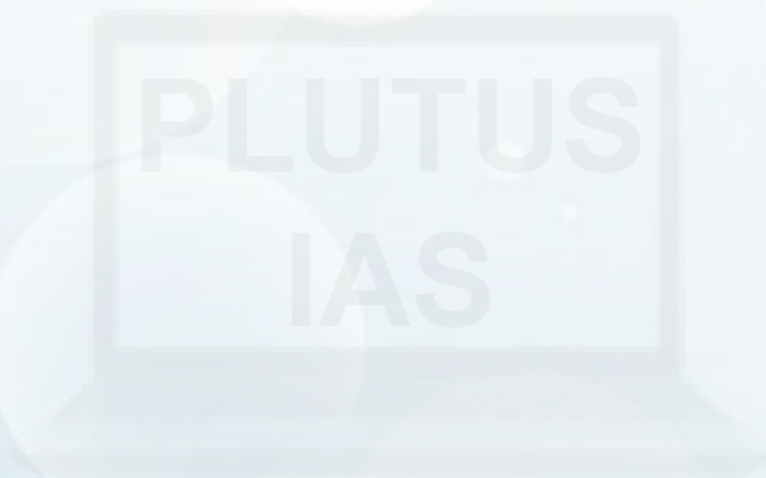
- Reduce the investors' confidence: The decrease in rating agencies deteriorates the country's financial system image and acts as a deterrence for investors.
- Increase the Premium on Interest Rates: Poor ratings increases risk perception, compelling governments to increase the rate on bonds.
- Policy Repercussions: The country formulates the policy in order to improve its rating not on the basis to increase growth and development.
- Isolated Debt Market: Companies and firms face a lot of difficulties to borrow money from the international market.



### **STEPS WERE TAKEN BY INDIA TO MAKE RATING AGENCIES ACCOUNTABLE**

- Disclose rating history.
- Disclose liquidity position.
- Narrowed disclosure standards.
- Reveal the source of funding.

The economic survey recommended that developing economies like India should be guided by consideration of development and growth and rather ignore the subjective and one-sided ratings.



# Anti Microbial Resistance

**Relevance for Prelims:** AMR (Anti Microbial Resistance)

**Relevance for Mains:** Causes and concerns associated with AMR, Steps taken by the government to tackle AMR

## WHY IN NEWS?

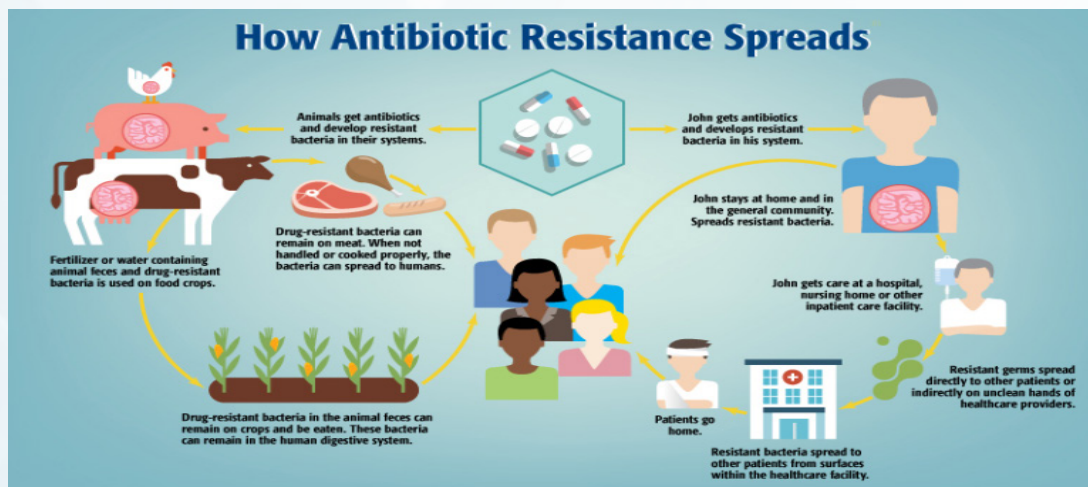
The World Health Organisation has declared AMR among the top 10 threats to the world.

## ABOUT ANTI-MICROBIAL RESISTANCE

Anti-Microbial Resistance occurs when bacteria, fungi, virus, and parasites do not respond to medicines which make infections difficult to treat. The microorganisms develop resistance to the drugs. Recently, WHO declared AMR as a continuing pandemic that required multi-sectoral action to achieve Sustainable Development Goals.

## CONCERNS RELATED TO AMR

- The tendency to self-medicate and creating own concoction and the easy availability of over-the-counter medications have increased the likelihood of being diagnosed with AMR.
- Many years of hard work in creating vaccines and medications have gone to waste as microorganisms have developed a resistance to them.
- It might postpone the achievement target of Sustainable Development Goals.
- Failure of antibiotics has led to increasing in death from diseases like Tuberculosis and Sepsis which are easily preventable.



How AMR Spreads

## **STEPS TAKEN BY GOVERNMENT AND GLOBAL ORGANIZATIONS**

- Chennai Declaration is a set of national recommendations to promote antibiotic stewardship.
- Red-Line campaign in India to create awareness among citizens to easily identify prescription drugs.
- FSSAI has recently banned the use of antibiotics in fisheries. The same has been done with cattle to decrease the use of antibiotics.
- Global Action Plan was formulated under the UN General Assembly which mandates a national plan on AMR.
- Global Anti-microbial resistance and Use Surveillance System (GLASS) was brought by WHO which progressively uses data for surveillance of AMR in humans, castles, etc.
- The WHO has identified AMR in the top 10 global threats to health. There is a dire need for a One Health Approach in which multi-sectoral actions and targets can be integrated.

## Joshimath crisis

*This article covers "Daily current events" and the topic is about the 'Joshimath Crisis' which is in news, it covers the "Land subsidence" In GS-3, and the following content has relevance for UPSC.*

**For prelims:** Geography of Joshimath and places around

**For mains:** Natural disasters, Floods, Land subsidence

### WHY IN NEWS:

The announcement was made following a high-level meeting between senior Central government officials, representatives from the state of Uttarakhand, and senior executives from organizations such as the National Disaster Management Authority (NDMA), Geological Survey of India (GSI), and the National Institute of Hydrology (NIH).

According to a study by the Uttarakhand State Disaster Management Authority (USDMA), the town is located in a landslide-prone area, and the first instance of subsidence there was detailed in a 1976 Mishra Commission report.

### LOCATION :

Joshimath, a town in the Garwhal Himalayas, is a significant stopping point on both the pilgrimage and hiking routes.

It is located at an elevation of 1890 meters. However, the settlement of over 20,000 people is also situated on a precarious mountain slope that has been made even more precarious by haphazard and indiscriminate growth.

On the Rishikesh-Badrinath National Highway (NH-7) in Uttarakhand's Chamoli district is the highland town of Joshimath.

The town is used by tourists who are traveling to Badrinath, Auli, the Valley of Flowers, Hemkund Sahib, and other significant religious and tourism destinations in the state as an overnight rest stop.

One of the most significant cantonments for the Army is located in Joshimath, which is also of tremendous strategic importance to the Indian armed forces.

Running streams with a steep gradient originate in Vishnuprayag, a confluence of the Dhauliganga and Alaknanda rivers, and they pass through the town (which is located in seismic zone-V with high risk).

### GEOLOGY:

The study emphasized how the Joshimath region is extremely susceptible to subsid-



ence due to eco-tectonic, geomorphic, and climatic elements combined.

Joshimath, which is in the Chamoli district and is located in Zone V of the Seismic Zonation Map, has seen a number of earthquakes with Richter magnitudes under 5.

Vayikra Thurst (VT), a tectonic fault line, is practically directly beneath Joshimath. The town is also extremely near two major geological fault lines, the Main Central Thrust (MCT) and the Pandukeshwar Thrust (PT).

The Town is located under Helang, a little to the south of Joshimath Town, where MCT juxtaposes with rocks from the Garhwal Group (Joshimath Formation), placing it in the effect zone of any tectonic activity on MCT.

The Border Roads Organization (BRO) is constructing a bypass at Helang. Which will cut the journey to the Badrinath shrine by around 30 kilometers. According to experts, the “earth tectonic activity” underneath may cause more landslides.

In 1976, the Mishra Commission report—headed by MC Mishra, recommended significant construction in the vicinity of Joshimath.

### **REASONS BEHIND THE SINKING OF JOSHIMATH**

A 1976 Mishra Committee investigation states that Joshimath is located on a layer of sand and stone rather than the main rock, which is where the ancient landslide that caused it occurred. On an old landslide, it is situated. According to the paper, the Alaknanda and Dhauliganga rivers’ currents also contribute to the occurrence of landslides by undercutting the ground.

Restrictions on heavy construction activities, blasting or excavating to remove rocks for road repairs and other works, and tree cutting were among the committee’s recommendations.

Geographically, boulders, gneissic rocks, and loose soil with a limited bearing capacity are covered by old landslide debris on the area’s dispersed rocks.

These gneissic rocks are severely worn, have a low cohesive value, and have a propensity for high pore pressure when wet, particularly during monsoons.

Unplanned Construction activities: Over the past two decades, increased construction, hydroelectric projects, and the enlargement of the NH have rendered the slopes extremely unstable.

Land Erosion: The city’s fate is also attributed to the flowing waters from Vishnuprayag and sliding along the natural waterways.



Joshimath crisis

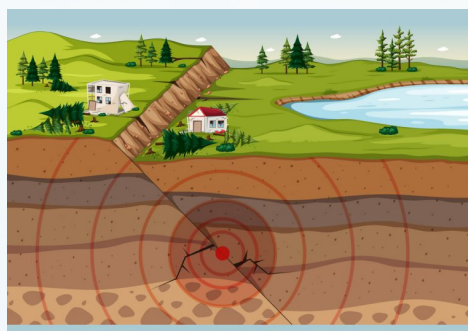
## LAND SUBSIDENCE

The term “land subsidence” refers to the slow settling or abrupt sinking of the Earth’s surface as a result of the loss or movement of subsurface earth elements.

The surface of the Earth may drop suddenly or gradually through land subsidence.

The most frequent cause of subsidence, which is the sinking of the ground as a result of underground material movement, is the removal of water, oil, natural gas, or mineral resources from the earth through pumping, fracking, or mining activities.

Additionally, subsidence can result from natural occurrences including earthquakes, soil compaction, glacial isostatic adjustment, erosion, the creation of sinkholes, and the addition of water to fine soils deposited by wind (a natural process known as loess deposits).



Recommendations of Mishra Committee Report:

- Limitations on heavy buildings should be put in place, and slope excavation should also be restricted. Construction should only be permitted once the stability of the site and the soil's ability to support loads has been assessed.
- Keeping the boulders: In landslide-prone places, it is important to avoid removing rocks and boulders from the hill's base because doing so would reduce the toe support and raise the risk of landslides.
- Crack sealing: It is important to seal any cracks that have formed on slopes. The bottommost portion of a landslide is known as the toe.
- Tree plantation: It is also suggested against felling trees in the landslide zone and suggested that significant planting be done there, especially between Marwari and Joshimath.
- It is forbidden to cultivate on slopes: Plowing, for example, loosens the soil, creating the potential for landslides.
- Water seepage Control: To stop the seepage of open rainwater, a pucca drainage system must be built. This will help to prevent future landslides.
- Cobbled roads: Cobbled roads must be metalled and free of scuppers, which remove water from the road surface.
- River training: It is important to build structures to direct the flow of the river. There should be adequate support for hanging boulders on the hillsides.

#### **WAY AHEAD:**

- Keeping people safe should be a top focus right away. The state administration needs to open up a direct line of communication with the impacted citizens.
- A reconstruction strategy with a deadline must be created.
- Seismic monitoring must be done continuously.
- Joshimath should also have a risk-sensitive urban development plan created.

#### **UPSC Civil Services Examination Previous Year Questions (PYQs):**

Q. Bring out the causes for more frequent landslides in the Himalayas than in the Western Ghats. (2013)

Q. Describe the various causes and effects of landslides. Mention the important components of the National Landslide Risk Management Strategy. (2021)



# Superconductivity of Mercury

*This article covers "Daily current events" and the topic is about 'Superconductivity of Mercury' which is in news, it covers the "scientific innovations and discoveries" In GS-3, and the following content has relevance for UPSC.*

**For Prelims:** Superconductor, Superconductivity of mercury

**For Mains:** GS-3, Science and technology

## WHY IN NEWS:

A recent discovery by a research team provides a clear picture of Mercury's superconductivity.

## ABOUT SUPERCONDUCTOR:

When a substance gets colder than a critical temperature, it is said to become a superconductor because it gives no resistance to the electric current.

Superconductors come in a variety of common forms, including those made of aluminum, magnesium diboride, niobium, copper oxide, yttrium barium, and iron pnictides.

## HOW MERCURY BECOMES A SUPERCONDUCTOR (SUPERCONDUCTIVITY OF MERCURY)

- Mercury's superconductivity was discovered in 1911 by Dutch physicist Heike Kamerlingh Onnes.
- The threshold temperature, which he discovered, is the point at which solid mercury presents no resistance to the flow of an electric current.
- Solid mercury presents no resistance to the flow of electric current below a very low temperature known as the threshold temperature.

## HOW MERCURY IS ABLE TO BECOME SUPERCONDUCTING: BARDEEN-COOPER-SCHRIEFFER (BCS) THEORY EXPLANATION

- Since the ideas of the Bardeen-Cooper-Schrieffer (BCS) hypothesis could account for the superconductivity of mercury, scientists categorized it as a conventional superconductor.
- Although the BCS theory has been used to explain superconductivity in a variety of materials, scientists have never fully grasped how it works in mercury, the earliest superconductor.



- Utilizing cutting-edge theoretical and computational techniques, the researchers discovered that mercury exhibits anomalies in all physical parameters pertinent to conventional superconductivity.

#### **BCS'S EXPLANATION:**

- In BCS superconductors, the atom grid's vibrational energy induces electron pairing, leading to the formation of so-called Cooper pairs.
- Below a certain temperature, these Cooper couples can flow without resistance like water in a stream.
- The team's simulations provided a clearer picture of how superconductivity develops in mercury by taking into account some elements that physicists had previously ignored.
- For instance, the researchers were able to explain why mercury has such a low threshold temperature (about  $-270^{\circ}\text{C}$ ) when they took into consideration the relationship between an electron's spin and momentum.

#### **RECENT DEVELOPMENT:**

- A research team in their article that was published in the journal Physical Review B, a team of Italian researchers addressed this gap.
- Modern theoretical and computational methods were applied by the researchers, who discovered that mercury exhibits anomalies in all the physical characteristics necessary for conventional superconductivity.
- The threshold temperature of mercury superconductivity was determined theoretically, and it was predicted to be within 2.5% of the measured value.

#### **CONSIDERATIONS OF BOTH RECENT AND HISTORICAL FACTORS:**

- The team's simulations provided a clearer picture of how superconductivity develops in mercury by considering several elements that were previously ignored (such as Cooper Pairs).
- When the researchers took into account the connection between an electron's spin and momentum, for instance, they were able to explain why mercury has such a low threshold temperature (of about  $-270^{\circ}\text{C}$ ).

#### **MERCURY AND THE COULOMB REPULSION:**

- Similar to this, the team discovered that in mercury, one electron in each pair had a greater energy level than the other.

- Apparently, this information reduced the Coulomb repulsion (in which charges repel one another) between them and promoted superconductivity.
- In this way, the team has clarified how mercury can behave as a superconductor below its critical temperature.
- Their techniques and findings imply that we might have overlooked analogous anomalous properties in other materials, opening the door to previously unrecognized ones that can be utilized for better and more innovative real-world applications.

#### **APPLICATIONS:**

- These are utilized in the memory section of computers as well as in submarine detection and underwater communication.
- utilized in medical diagnostics, such as in nuclear magnetic resonance imaging equipment and other magnetic imaging systems (NMR).
- utilized for train levitation at high speeds.
- Magnetic cardiograms, based on magnetic fields produced by electric currents in the heart, can be obtained using SQUIDS (Superconducting Quantum Interference Devices).

#### **WAY AHEAD:**

- This creates opportunities to examine other materials for superconductivity, which exhibits comparable odd phenomena in other materials.
- It can be used to develop fresh and improved real-world applications.

## Estuary: Habitat of Indian Skimmer

*This article covers “Daily current events” and the topic is about ‘Godavari estuary and Indian skimmer’ which is in news, it covers the “Environment and ecology: Conservation” In GS-3, and the following content has relevance for UPSC.*

**For Prelims:** Facts about Godavari estuary, Indian skimmer, Mangroves, Ramasar site

**For Mains:** GS-3, GS-1, Geography of Godavari estuary and Coringa Wildlife sanctuary, Mangroves, Ramasar site

### WHY IN THE NEWS:

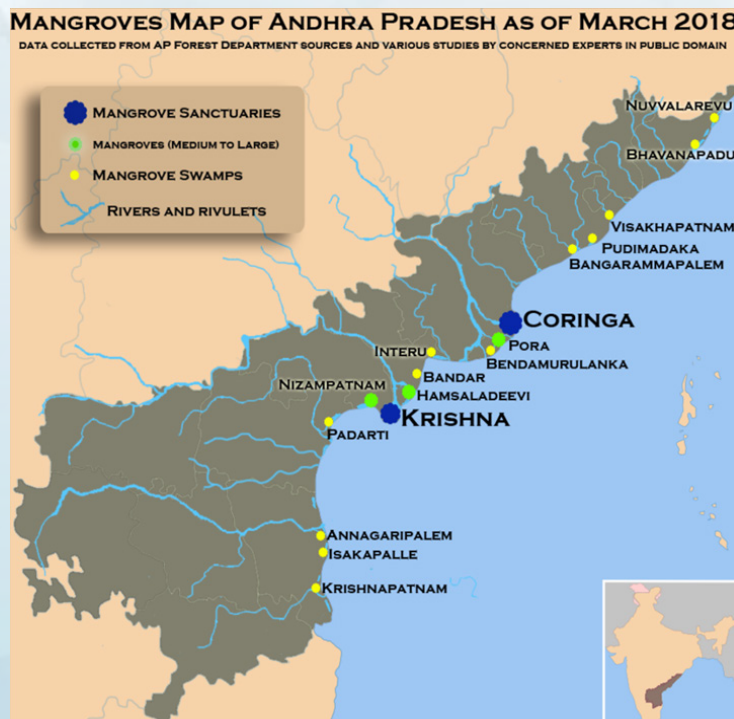
According to the deputy director of the Bombay Natural History Society (BNHS), the Godavari estuary in Andhra Pradesh has developed into an ideal and secure habitat for the Indian Skimmer (*Rynchops albicollis*).

### ABOUT GODAVARI SANCTUARY

The Godavari Mangroves of the Coringa Wildlife Sanctuary (CWLS) are reputed to be the second-largest mangroves in India. The Sundarbans in West Bengal are the world's largest mangrove forest.

In the estuaries of the Krishna and Godavari rivers, Andhra Pradesh has mangrove forests. The Godavari mangroves are situated in the East Godavari district's Godavari Estuary.

### GODAVARI ESTUARY



## **MANGROVES MAP OF ANDHRA PRADESH**

The CWLS, which is situated in Andhra Pradesh, is home to several endangered species, including the fishing

- cat, Indian skimmer, otter, jackal, sea turtles, seagulls, pelicans, storks, herons, snipes, and flamingos, among others.
- Along with the mangrove forest, the sanctuary also has jurisdiction over Hope Island, a naturally created sandy stretch in the middle of the sea that has become synonymous with biodiversity.
- Olive Ridley Sea Turtles also annually nest at a location in the refuge from January to March.
- When UNESCO designates the Coringa sanctuary as a heritage site, both tourists and the wildlife that lives in the mangroves will benefit.

## **ESTUARY ECOSYSTEM**

- Where a river or a stream empties into the sea is known as an estuary (mouth of the river).
- It is a coastal region that is partially enclosed, brackish (salinity ranges from 0-35 ppt), has one or more rivers or streams running into it, and has a free connection to the open sea.
- Between river ecosystems and ocean settings, estuaries create an ecological transition zone (ecotone).
- River mouths, coastal bays, tidal marshes, lagoons, and deltas are all examples of estuaries.
- Estuaries are created as a result of tectonic activity, sea level rise, sand and sandbar movement, glacial activities, and sand migration.
- Every plant and animal in estuaries is exposed to salinity changes, to which they have evolved (osmoregulation).
- Tidal motion has a big impact on estuaries. Depending on how many tides there are, they receive a daily or twice-daily seawater wash.
- Tidal bores are important in some small estuaries. Tidal bores seriously harm the ecology of the estuary.
- Freshwater carrying fertile silt and runoff from the land combines with salty sea water at estuaries.



## IMPORTANCE OF ESTUARY

- Because marine species from both ecosystems coexist in a zone of mixed freshwater and saline water, these bodies of water are the most productive in the world (more productive than wetlands).
- Mangroves, wetlands, estuaries, grasslands, and other ecotone regions (transitional zones) have far higher productivity levels than natural ecosystems such as forest ecosystems, ocean ecosystems, pond ecosystems, riverine ecosystems, desert environments, etc. This is a result of the diverse species from the nearby ecosystems existing in the ecotone.
- Additionally, an estuary has relatively little wave activity, making it a peaceful haven from the open sea that is suitable for the survival of many aquatic species.
- During storms and strong landward winds, the extensive mangrove forests on an estuary's seaward side serve as a barrier to keep the wind from reaching the coastal habitat.
- Mangroves serve as a filter, capturing muck and sand carried downstream by rivers, causing deltas to form around estuaries.
- Due to the exposure to salt water, clay and alluvium particles precipitate frequently in the estuary region (saline water precipitates fine alluvium).
- Estuaries serve as a barrier between coastal catchments and the marine environment by storing and recycling nutrients, trapping sediment, and trapping water.
- They serve as a natural water filter by absorbing, trapping, and detoxifying contaminants.
- Fisheries are among the many natural resources found in estuaries, which also have wetlands, creeks, lagoons, mangroves, and seagrass beds.
- As a result, they make excellent places for ports and harbors because they are deep and well-protected from maritime infractions.
- Human settlements often locate themselves along the banks of estuary channels. These towns use the estuaries for commercial and recreational purposes, as well as for the disposal of municipal and industrial waste today.

## THE INDIAN SKIMMER (RYNCHOPS ALBICOLLIS)

- The Indian skimmer's large, orange-yellow beak and slightly longer lower mandible (jaw) are two of its most distinctive characteristics (*Rynchops albicollis*).
- The maximum length of the Indian Skimmer: 40-43 cm



Indian Skimmer

### **DISTRIBUTION**

The coastal estuaries of western and eastern India are home to the Indian skimmer, which is more prevalent during the winter months.

Larger, sandy lowland rivers, lakes, and nearby marshes are its main habitats. During the non-breeding season, estuaries and coastlines are also where you can find it.

Less than 2,500 birds make up the population, and about 20% of them nest along the Chambal River.

The species is found in India near the Chambal river in Central India, in a few locations in Odisha, and in Andhra Pradesh.

- IUCN Red List: Endangered
- CITES Status: Not included.

### **THREAT**

Its population reduction is primarily due to the loss of wetlands and riverine habitats.

The damming of the Chambal River in upstream Rajasthan has had a detrimental effect on its population at the National Chambal Sanctuary in Uttar Pradesh because the reduced water levels allowed predators and cattle access to breeding islands.

## Assisted Reproductive Technology (ART)

*This article covers “Daily current events “and the topic is about ‘Assisted Reproductive Technology ’ which is in news, it covers “Government policies and interventions, scientific innovations and discoveries” In GS-2 and GS-3, the following content has relevance for UPSC.*

**For Prelims:** About Assisted reproductive technology, health, ART regulations act

**For Mains:** GS-2, GS-3, Government policies and interventions, Health aspects of women, Impact of ART regulation act, 2021

### WHY IN NEWS:

According to the Kerala High Court, deciding whether to start a family is a fundamental right and placing an age restriction on it is a restriction that has to be reviewed.

### ABOUT ASSISTED REPRODUCTIVE TECHNOLOGY

- This definition states that all fertility therapies that deal with either eggs or embryos are considered to be ART. In general, ART treatments entail surgically removing eggs from a woman's ovaries, fertilizing them in a lab with sperm, and either putting them back into her body or giving them to another woman.
- They exclude procedures where only sperm are treated (such as intrauterine—or artificial—insemination) or where a woman takes medication solely to increase egg production without intending to have eggs extracted.

### CONCERN ASSOCIATED

- When deciding on a number of petitions contesting the age requirement of 50 for women and 55 for men set forth in the Assisted Reproductive Technology (ART) (Regulation) Act, 2021, for undergoing assisted reproductive technology, the court issued the directive.
- The petitioners contend that the ART Act's Section 21(G) prescription of the upper age restriction is arbitrary, unjustified, and a violation of their right to reproduction, which is recognized as a basic right.
- They attempted to have it ruled unconstitutional.
- The National Assisted Reproductive Technology and Surrogacy Board has been instructed by the High Court to inform the Union government that the maximum age limit for utilizing assisted reproductive technology has to be reviewed.



- In addition, the petitioners have contested the clause that includes medical professionals in the scope of the Indian Penal Code (IPC) and makes offenses cognizable.
- Due to the threat of legal action, these regulations are having a chilling effect on IVF practitioners across the nation, preventing them from carrying out their professional responsibilities.

## **ABOUT THE ASSISTED REPRODUCTIVE TECHNOLOGY (REGULATION) ACT, 2021**

### **LEGAL REQUIREMENTS**

A system for implementing the ART (Regulation) Act 2021 is provided.

By establishing the National Assisted Reproductive Technology and Surrogacy Board, the ART (Regulation) Act 2021 offers a structure for carrying out the surrogacy law.

The Act aims at regulating and monitoring ART clinics and banks, preventing misuse, and ensure the safe and moral provision of ART services.

### **ART SERVICES ARE AS FOLLOWS**

The Act defines ART as any method that attempts to conceive a child by handling the sperm or oocyte (immature egg cell) outside of the body and transferring the gamete or embryo into the female reproductive system. These include gestational surrogacy, in vitro fertilization (IVF), and sperm or egg gamete donation.

### **THE FOLLOWING CHANNELS WILL OFFER ART SERVICES**

- ART banks, which collect, filter, and store gametes, as well as
- ART clinics, which provide ART-related treatments and procedures.

### **DONOR ELIGIBILITY REQUIREMENTS**

Males and females between the ages of 21 and 55 may provide semen, and females between the ages of 23 and 35 may provide eggs. Only one egg donation is allowed per woman's lifetime, and no more than seven eggs may be taken from her. A bank is not allowed to provide a single donor's gametes to more than one commissioning party (i.e., couples or single women seeking services).

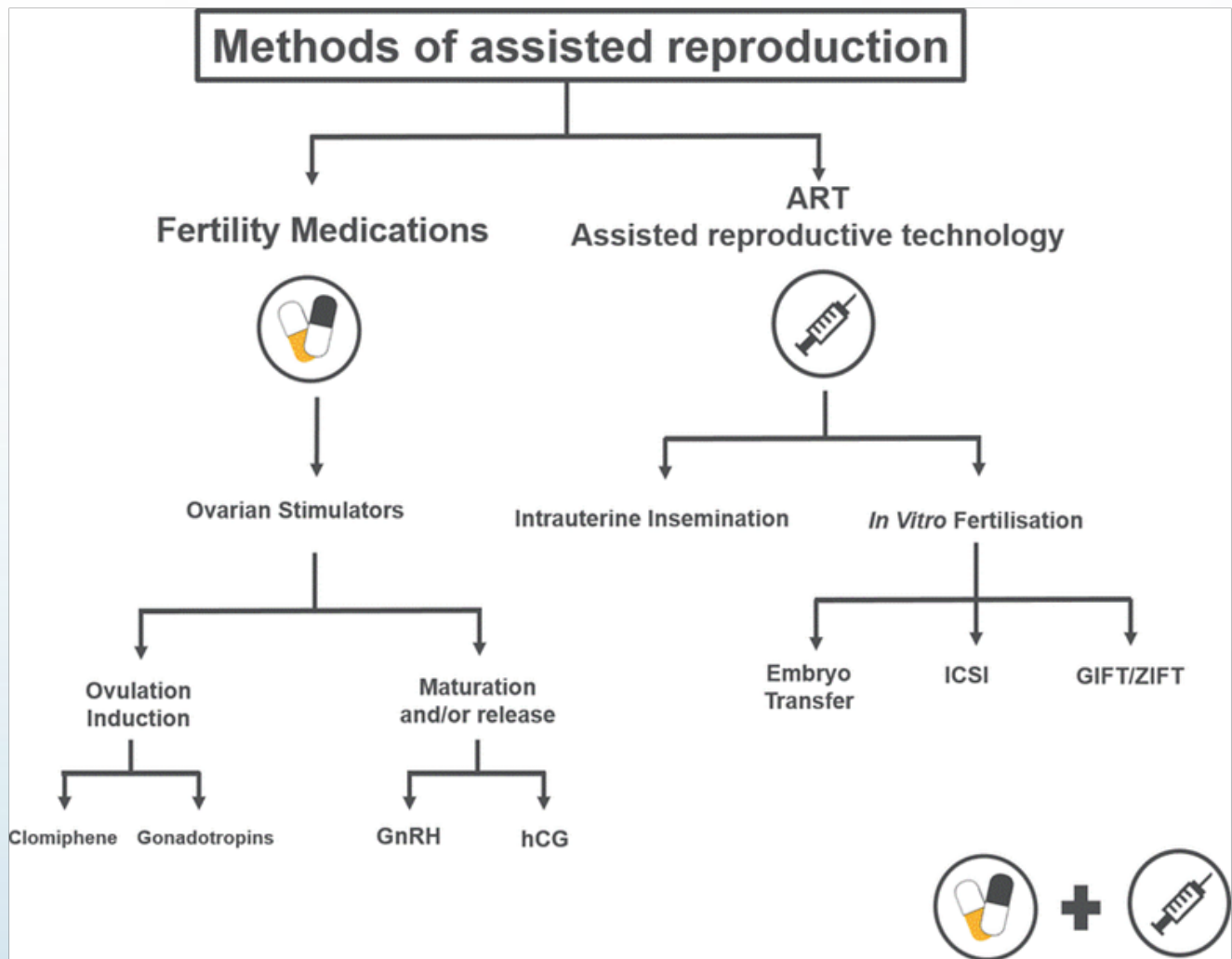
### **CONDITIONS FOR OFFERING SERVICES**

Only with the donor's and commissioning parties' written approval may ART treatments be performed. In order to protect the egg donor, the commissioning party must provide insurance (for any loss, damage, or death).



## RIGHTS OF A CHILD BORN THROUGH ART

A Child Born Through ART Will Be Considered a Biological Child Of The Commissioning Couple And Will Be Entitled To The Rights And Privileges Available To A Natural Child Of The Commissioning Couple. A donor won't have any parental responsibilities for the child.



Assisted Reproductive Technology (ART)

## SHORTCOMINGS

- Unmarried and heterosexual couples are excluded

The Act prohibits transgender people, married or unmarried homosexual couples, divorced or widowed homosexual couples, and unmarried but cohabiting heterosexual couples from utilizing ART services.

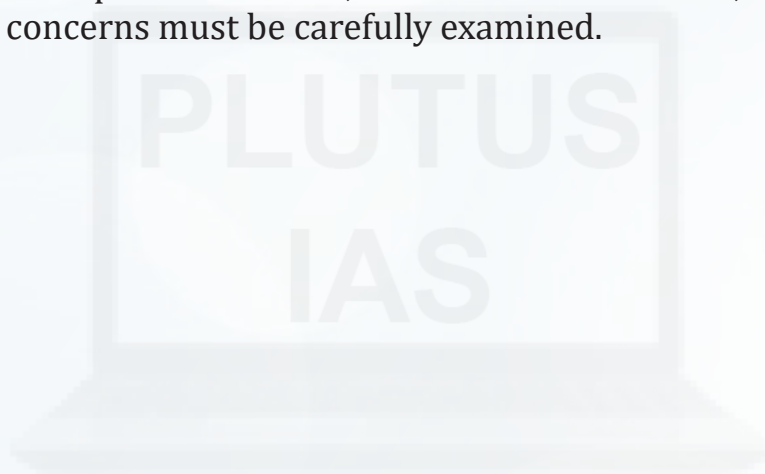
This exclusion is important since the Surrogacy Act forbids the aforementioned individuals from using surrogacy as a means of reproduction.

- **Reduces Reproductive Options:** The Act is only applicable to commissioning couples who are infertile, or who have been unable to conceive after a year of unprotected coitus. The reproductive options of individuals who are excluded are thus much diminished and its applicability is constrained.

Prices are not regulated, but this is something that can be fixed with a few straightforward instructions.

#### **WAY AHEAD:**

- Independent groups, not clinic ethics committees, should give the required counseling, not patients.
- The directives of the federal and state governments should be binding on all ART entities since they serve the national interest, good relations with other countries, and the public interest.
- Prior to having an impact on millions, all raised constitutional, medico-legal, ethical, and regulatory concerns must be carefully examined.



# Free Trade Agreements

*The topic talks about how the Free trade agreement impacts the Indian Economy.*

**Relevance for Prelims:** About FTA, FTA in news

**Relevance for Mains:** Utility and back draws of FTA's

## WHY IN NEWS?

Recently, India has been in talks with many countries to sign a Free Trade Agreement.

## ABOUT THE FREE TRADE AGREEMENTS

Free Trade Agreements are agreements between one or more than two countries where they decide to reduce or bring down the tariffs imposed by them. Recently, it has been noted by many economists that many FTA signed by India has not turned out beneficial for them.

## REASONS FOR ADVERSE RESULT OF FTA'S SIGNED BY INDIA

**Asymmetric Benefit:** A report by the Asian Development Bank observed that India utilizes the potential of its FTA to a very low extent which is the lowest in Asia. (2-25%).

**Limited Export Growth in Value-Added Sectors:** Out of 21 sectors, India suffers Trade Deficit in 13 sectors. Growth in value-added sectors has been very sluggish.

**Misuse of FTAs:** Many countries like China have misused the FTAs signed by India with ASEAN. Example: Exponential Rise of Electronics from Vietnam and Myanmar which are routed from China. This is known as the Circumvention of Rules of Origin.

**Non-Tariff Barriers:** Barriers like phyto-sanitary controls restrict the quantum of sales and growth of India's economy.

**Domestic Elements:** High logistics costs and difficulty in doing business are among a few reasons for the low utilization of FTAs.

Strengthening the Rules of Origin Mechanism and starting negotiations on existing FTAs is the need of the hour. The current global dynamics make a perfect case for India to relook at its FTAs through a new lens.

# INFLATION IN UNITED STATES

**Relevance for Prelims:** Inflation in the United States and its implications on Global World

**Relevance for Mains:** Bond Yield Inversion and Recession

## CONTEXT

Recently, the Inflation level in the United States has surpassed 6%, the highest ever in the last 30 years. These figures are attracting a lot of attention around the globe leaving repercussions everywhere.

There are many reasons which could be attributed to an increase in inflation such as an increase in money supply by Fed Reserve Bank, Handout-induced, and supply-side disruptions.



Inflation in the US

## IMPACT OF INFLATION IN THE UNITED STATES ON INDIA

- **IMPORTED INFLATION:** Price rise in global economies results in imported inflation. Whatever India buys from the US will be costly comparatively and will further induce inflation.
- **CONTRACTIONARY MONETARY POLICY:** An increase in inflation generally leads to the central bank using contractionary policies which will decrease consumption, leading to fewer exports in India.
- **HIGH COST OF BORROWING:** Indian investors who borrow funds from overseas markets owing to lower interest rates will find it higher due to contractionary monetary policy which makes lending dearer.
- **IMPACT ON REMITTANCES:** An increase in inflation could also affect in remittance supply, given the fact the U.S. is one of the top countries from which India receives remittances.
- To deal with this situation, RBI might have to align its policies with global ones as imported inflation is one of the worst to deal with.



## Local Bubble

*This article covers “Daily current events” and the topic is about ‘Local bubble’ which is in news, it covers “Science and Technology” In GS-3, and the following content has relevance for UPSC.*

**For Prelims:** Facts about local bubbles

**For Mains:** GS-3, Space technology

### WHY IN NEWS

The origins of stars and other mysteries of the cosmos may be revealed by recent research on a vast cosmic void that surrounds the solar system.

A 3D magnetic map of the hollow known as the Local Bubble has been created by researchers from the Center for Astrophysics (CfA) | Harvard & Smithsonian.

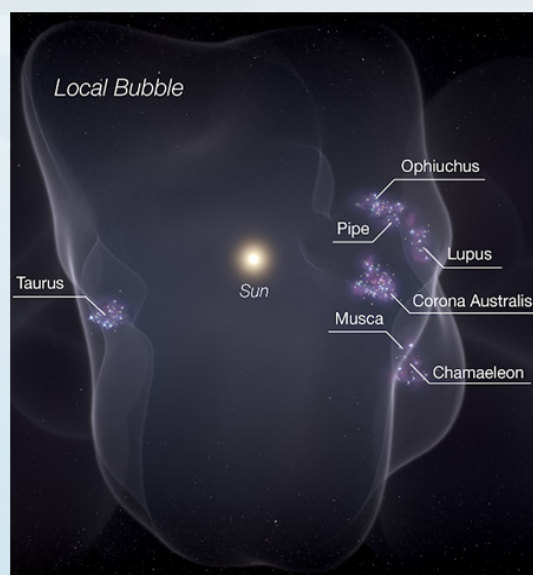
### ABOUT LOCAL BUBBLE

The Local Bubble is a superbubble with a diameter of 1,000 light-years. There are further superbubbles in the Milky Way.

The Local Bubble is a sizable, low-density area in the Milky Way’s interstellar medium (ISM).

The substance that encloses the void between stars is known as the interstellar medium.

A succession of supernova explosions that took place between 30 and 50 million years ago is likely to have formed the cavity that is responsible for it.



Local Bubble

## WHAT IS A SUPERNOVA

After a large star's existence, a supernova is a strong and bright explosion.

A significant amount of energy can be released when the star's core collapses, which is what causes it.

In addition, supernovae play a key role in the spread of cosmic rays and the enriching of the interstellar medium with heavy metals.

## SUPERNOVA OFTEN FALLS INTO TWO CATEGORIES

**Type I:** This white dwarf star, which is a member of a binary system, thermonuclear exploded, resulting in a supernova.

When the white dwarf's mass reaches a particular point, it becomes unstable and explodes. The white dwarf accretes material from its companion star.

**Type II:** It results from the gravitational collapse of a big star's core.

When a star's nuclear fuel runs gone, the outer layers of the star collapse inward, causing the core to become extremely hot and dense.

The star explodes as a result of the enormous amount of energy released as a result.

For a moment, the explosion's brightness can temporarily eclipse the entire galaxy, and the explosion's debris can lead to the production of nebulae, dust, and heavy elements.

## HOW WAS A 3D MAP OF A HUGE CAVERN FILLED WITH NEARBY BUBBLES OBSERVED

- They made use of the Gaia and Planck space-based observatories that the European Space Agency had launched (ESA).
- To pinpoint the location and local concentration of cosmic dust, Gaia was employed.
- This enabled them to identify the Local Bubble's perimeter.
- The magnetic alignment of cosmic dust was revealed by Planck.
- This alignment can help researchers create a 3D magnetic field orientation on the surface of the Local Bubble by indicating the direction of the magnetic field acting on the dust particles.

## UPSC Civil Services Examination, Previous Year's Question (PYQs)

Q. Recently, scientists observed the merger of giant 'black holes' billions of light-years away from the Earth. What is the significance of this observation? (2019)

- (a) 'Higgs boson particles' were detected.
- (b) 'Gravitational waves' were detected.
- (c) Possibility of intergalactic space travel through a 'wormhole' was confirmed.
- (d) It enabled the scientists to understand 'singularity'

Ans: (b)

## ISRO setting back the “Shukrayaan” Venus mission to 2031

*This article covers “Daily current events” and the topic is about the ‘Shukrayaan Mission in 2031’ which is in news, it covers “Science and Technology” In GS-3, the following content has relevance for UPSC.*

**For Prelims:** Facts about the Shukrayaan mission

**For Mains:** GS-3, Space technology, Significance and challenges associated with it.

### WHY IN NEWS:

- A professor at the Indian Space Research Organization (ISRO) and advisor to its space research program stated in a talk that the organization has not yet received Indian government approval for the Venus trip and that the project may therefore be delayed until 2031.
- Shukrayaan I, the name of ISRO’s Venus mission, was slated to go off in December 2024. The concept was conceived in 2012, and after the Department of Space got a 23% increase in funding for the 2017–2018 budget, ISRO started preliminary research five years later. In April 2017, the organization asked research institutions for payload proposals.

### ABOUT SHUKRAYAAN MISSION

- The orbiter may carry a science payload of up to 100 kg and 500 W of electricity, depending on the final configuration.
- 500 km at periapsis and 60,000 km at apoapsis are predicted for the original elliptical orbit of Venus.
- The GSLV Mk II rocket is intended to carry the satellite into orbit.
- With a scientific instrument to examine the planet, Sweden is joining India’s Venus orbiter mission, “Shukrayaan.”
- Venusian Neutrals Analyzer (VNA), a satellite instrument from the Institute of Space Physics (IRF), will examine the interactions between the planet’s atmosphere and exosphere and charged particles from the Sun.

### AIMS AND OBJECTIVES OF THE SHUKRAYAAN MISSION

- For the Investigation of shallow subsurface stratigraphy and surface processes.
- No previous observations of Venus’s subsurface have been made before.
- In the field of geology known as stratigraphy, rock layers and layering are investigated.

- To study the atmosphere's behavior, chemistry, and structure.
- Examining the effects of the solar wind on the ionosphere of Venus.

## **SIGNIFICANCE**

- Learning about the evolution of Earth-like planets and the conditions on Earth-sized exoplanets will be useful (Planets that orbit a star other than our sun).
- It will aid in Earth's climate modeling and serves as a sobering reminder of just how drastically a planet's climate can alter.
- A device to study Venus' atmosphere in the infrared, ultraviolet, and sub-millimeter range will also be carried by the expedition.
- It will shed light on the atmospheric conditions and the evolution of Earth-like planets.
- A futuristic illustration of how climate change may significantly affect a planet will also be a goal of this project.

## **CHALLENGES:**

- Given its dense atmosphere and surface activities, which make it a complicated planet, Venus presents various difficulties compared to Mars.
- The equipment must penetrate the atmosphere deeply in order to gain deeper knowledge.
- The space agency intends to utilize a high-resolution Synthetic Aperture Radar (SAR) on the spacecraft as one of its instruments to analyze Venus' surface despite the planet's surrounding clouds.
- In order to see through the clouds and darkness of the Venusian atmosphere, high-resolution sensors are required.

## **ABOUT THE VENUS**

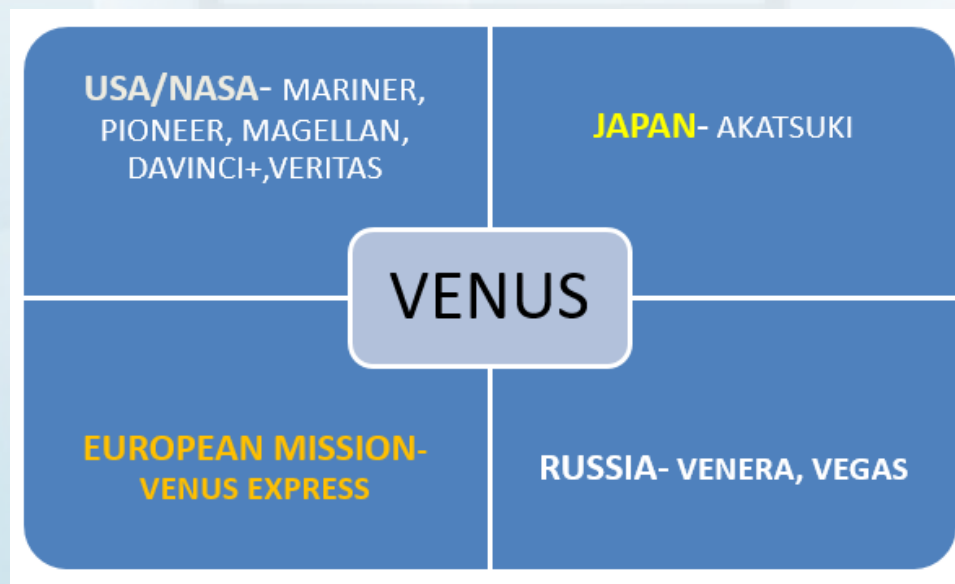




## VENUS

- It is the second-brightest natural object in the night sky after the Moon, which is presumably why it was the first planet whose motions were mapped across the sky in the second millennium BC.
- Venus and Uranus rotate on their axes in the opposite direction from the other planets in our solar system.
- Due to the extreme greenhouse effect caused by the high concentration of carbon dioxide, it is the warmest planet in the solar system.
- Venus has days that are longer than a year. Venus takes longer to complete one rotation on its axis than it does to complete one orbit around the Sun.
- The longest rotation of any planet in the Solar System is 243 Earth days. The shortest orbital period of the Sun takes only 224.7 Earth days.
- Because of their comparable relative positions in the solar system and their similar masses, sizes, and densities, Venus has been referred to as Earth's twin.
- No planet comes closer to Earth than Venus, which at its closest point is the only other big body that is closer than the Moon.
- The pressure of Venus' atmosphere is 90 times that of Earth.

## OTHER MISSIONS TO VENUS



## Doppler weather radar network by IMD

*This article covers "Daily current events" and the topic is "The Doppler weather radar network" which is in news, it covers "Science and Technology" In GS-3, the following content has relevance for UPSC.*

**For Prelims:** Facts about the Doppler effect

**For Mains:** GS-3, Significance of Doppler weather radar

### WHY IN NEWS:

The Ministry of Earth Science has officially opened the Doppler Weather Radar (DWR) Systems in Jammu & Kashmir, Uttarakhand, and Himachal Pradesh on the occasion of the 148th anniversary of the establishment of the India Meteorological Department (IMD).

The Doppler weather radar network will be spread across the entire nation by 2025, according to plans made by the Ministry of Earth Science, allowing for more precise forecasts of extreme weather events.

### HOW IT WORKS:

A parabolic dish antenna and a foam sandwich spherical radome are used in the radar, which is based on the Doppler principle, to increase precision in long-range weather forecasting and surveillance.

DWR is equipped to find a storm center, as well as the path of a tornado or gust front, as well as to measure the intensity and velocity of wind shear and rainfall.

### ABOUT DOPPLER RADAR EFFECT

It is a customized radar that generates velocity information about distant objects by using the Doppler effect.

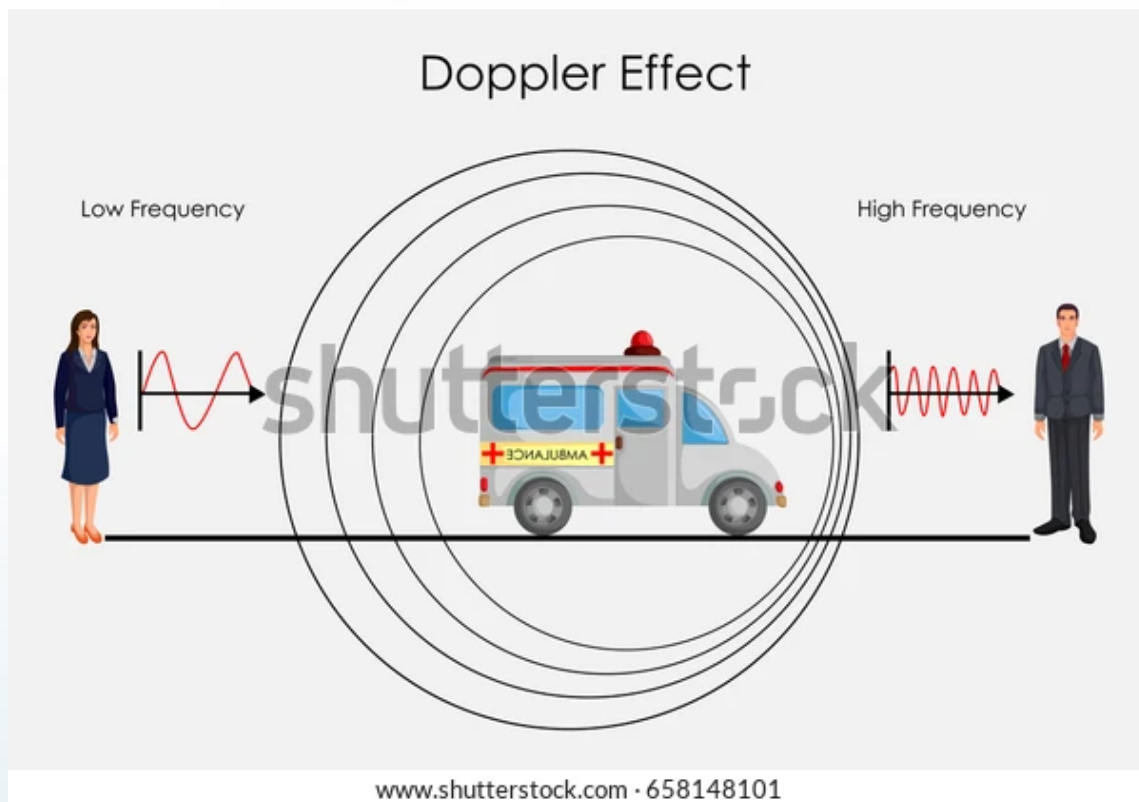
It utilizes a parabolic dish antenna with a foam sandwich spherical radome to increase precision in long-range weather forecasting and surveillance.

It has the tools necessary to pinpoint the center of a storm, the path of a tornado or gust front, and the intensity and velocity of the wind.

In the case of a natural disaster brought on by severe weather, it gives advanced information, boosting the lead time that is so crucial for saving lives and protecting property.

Doppler radars are classified according to their uses as follows: Doppler radar can be

categorized into several different groups based on wavelength, and these groups are L, S, C, X, and K.




Doppler Radar effect

## RADIO DETECTION AND RANGING (RADAR)

It is a device that employs electromagnetic radiation in the microwave spectrum to identify the range and direction, altitude, intensity, and motion of moving and stationary objects.

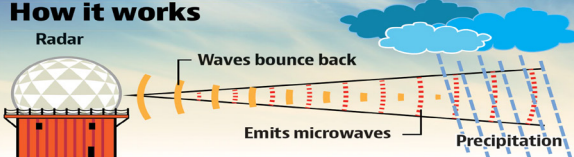
### Ayanagar station gets an upgrade

Two such radars are already functioning at Palam (2010) and Lodhi Road (2012). Ayanagar DWR has a smaller influence area but it is the most precise



Delhi installed its third doppler weather radar (DWR) system this week — an X-band radar at Ayanagar station. It has an influence area of 100km. The X-band radar operate on frequencies in the X-range, that fall in the microwave region of the electromagnetic spectrum. DWRs were installed at Palam and Lodhi Road observatories in 2010 and 2012 respectively.

#### How it works



**How a DWR works**  
Basically, it works on the principle of the Doppler effect that describes the change in frequency of a wave in relation to an observer who is moving relative to the wave source. The radar emits micro or radio waves from its antenna, which hits clouds and other objects in the atmosphere and return to the radar, allowing it to gauge how far rain clouds or rainfall activity actually is from the city. Based on the distance and trajectory of the clouds, the IMD can accurately forecast when rainfall will hit a particular point in the city, along with its expected intensity.

**Tech at other stations**

- **Palam** (Delhi airport) - It has an S band DWR in place with an effective range of 400km and can detect thunderstorm and gusty winds 200-300km away. It is mainly use to detect severe weather and forecast aviation weather hazards such as wind shear, thunderstorm and dust storm activity.
- **Lodhi Road** - It has a C-band doppler radar and is used to detect thunderstorms and heavy rainfall over Delhi-NCR with a 250km radius. It was currently being used to detect and forecast rain activity in the region that is set to occur within the next few hours. In comparison, the new X-band radar at Ayanagar will only influence a 100km radius, but will be more precise in rainfall forecasting.
- **Safdarjung** - Delhi's base observatory has been in place before the independence and still uses manual instruments which need to be calibrated regularly. Readings are also collected physically. Like Safdarjung, the Ridge station is also a manual station.
- **Automatic weather stations** - Delhi began installing automatic weather stations from 2009 onwards, before the 2010 Commonwealth Games in order to provide venue-specific weather forecasts. Unlike manual instruments and stations, AWS provide readings directly to a computer system every day. There are AWS currently installed in Narela, Mayapuri, Najafgarh, Jafarpur, Pitampura and the Sports Complex in east Delhi.

## **How A DWR Works**

### **THE DOPPLER RADAR**

It is a customized radar that produces velocity data about distant objects by utilizing the Doppler effect.

The Doppler effect The frequency that is being observed by the observer changes as the source and the signal is moving relative to one another. The frequency rises as they go closer, and the opposite is also true.

This is achieved by sending a microwave signal toward a target and measuring how the frequency of the returned signal has changed due to the motion of the target.

This variation allows for direct and extremely accurate measurements of a target's radial component of velocity concerning the radar.

### **TYPES**

- L Band Radars: Work at a frequency of 1-2 GHz and a wavelength of 15–30 cm. mostly employed for research of clean air turbulence.
- S-band radars: They function between 2-4 GHz and have a wavelength of 8 to 15 cm. The wavelength and frequency of S-band radars make them difficult to attenuate. They can thus be used for both local and global weather observation. This band of radar has the disadvantage that it needs a big antenna dish and a big motor to power it.
- C band radars: They function between 4 and 8 cm in wavelength and 4 and 8 GHz in frequency. The size of the dish does not need to be extremely great because of the wavelength and frequency.

As a result, TV stations can afford C-band radars. This kind of radar works best for close-range weather observation since the signal is more easily muted.

- X-band radars: They function at a frequency of 8–12 GHz and a wavelength of 2.5–4 cm. The X-band radar has a shorter wavelength, which makes it more sensitive and capable of detecting tiny particles. Lightning and thunderstorm detection are done using it.
- K band radars: They function at frequencies of 27–40 GHz and 12–18 GHz, respectively, with wavelengths of .75–1.2 cm or 1.7–2.5 cm. A strong water vapor absorption line causes this band to be split in half. It's only that this band is more sensitive. It's comparable to the X band.

### **SIGNIFICANCE OF THE DOPPLER RADAR**

- The accuracy of weather forecasts has improved by 20–40% for various severe



weather events.

- Farmers and fishers benefit from the warning and advising services as their economies grow.
- For instance, a rupee invested in the monsoon mission program returned 50 rupees for every rupee invested.
- Agromet Advisories at District and Block Levels are used efficiently by millions of farmers at all stages of farming, and the service is expanding. This has been especially beneficial for farmers living below the poverty line.
- It aids the general public, disaster management, and stakeholders in launching prompt reaction actions to further mitigate calamities.
- The ability to predict the monsoons, which is essential for maintaining our food security, has improved the economy and decreased the number of fatalities brought on by monsoonal floods and droughts in south Asia.
- With their accurate forecasts and prompt warnings, these advancements have helped in recent years to reduce the death toll from a variety of extreme phenomena like cyclones, heavy rain, thunderstorms, heat waves, and cold waves.

#### **WAY AHEAD**

- To supply climate goods and information for sectoral applications, a national framework should be established as soon as possible.
- It is imperative that the disaster managers, general public, and stakeholders adhere strictly to the National Disaster Management Plans, rules, and SOPs put in place by the current administration.

# LPG Reforms in India

**Relevance for Prelims:** LPG reforms in India

**Relevance for Mains:** Significance of LPG reforms

Indian Economic Policy was influenced by Fabian Socialism since its independence. This led Indian Economy to lean towards protectionism and strong control of the state over Industries. The Balance of Payment Crisis was necessitated.

India to open its economy to the world thus bringing LPG reforms.



LPG Reforms in India

## FACTORS THAT LED TO LPG REFORMS

- Licensed Raj: Legislations like MRTP (Monopolistic and Restrictive Trade Practice) not only slowed down the quantum of production but also strengthen control of the quality of products.
- Almost Autarky: High Tariff Barriers and the Inconvertibility of the Rupee made India almost an autarky.
- Balance of Payment Crisis: Gulf War led to a mismatch in expenditure and receipts which further led to BOP Crisis.
- Nudge by IMF: Stark choices presented by International Monetary Fund provided an impetus to open the economy to the world.

## THE INDIAN GOVERNMENT QUICKLY RESPONDED BY

- Deserving Industries
- De-regulation of Industrial Sectors

- Financial and Tax Reforms (Role of RBI reduced, Deduction in Corporate Tax)
- Foreign Exchange Reforms
- Removal of Trade Barriers

### **IMPACT OF REFORMS**

- Increase in Foreign Investment: By 2016, India received around more than \$ 100 Billion in FDI which was almost negligible in Pre-LPG Era.
- Exponential Growth in GDP: Barring Inflation and Currency devaluation, the size of an economy shot from 6 lakh crore to more than 140 lakh crore.
- Stability in Prices: The prices of essential goods and services have been relatively stable since the introduction of LPG reforms barring a few exceptions.
- Rise of Middle Class: The arrival of MNCs and supply-demand dynamics has led to rising of the Middle Class in the India Economy. Irrespective of the increase in the size of the economy and exponential rise in GDP, inequality in the country has further increased as Globalization has posed tough challenges to domestic industries in terms of the quality of products and services.
- There have been several reforms taken by the Government to fill the loopholes which were left even after 1991 reforms like the Goods and Service Tax, IBC, and Direct Tax Code. The 1991 reforms were successful in taking out the Indian Economy from the woods. The COVID-19 Pandemic has therefore necessitated outlining the new reforms.

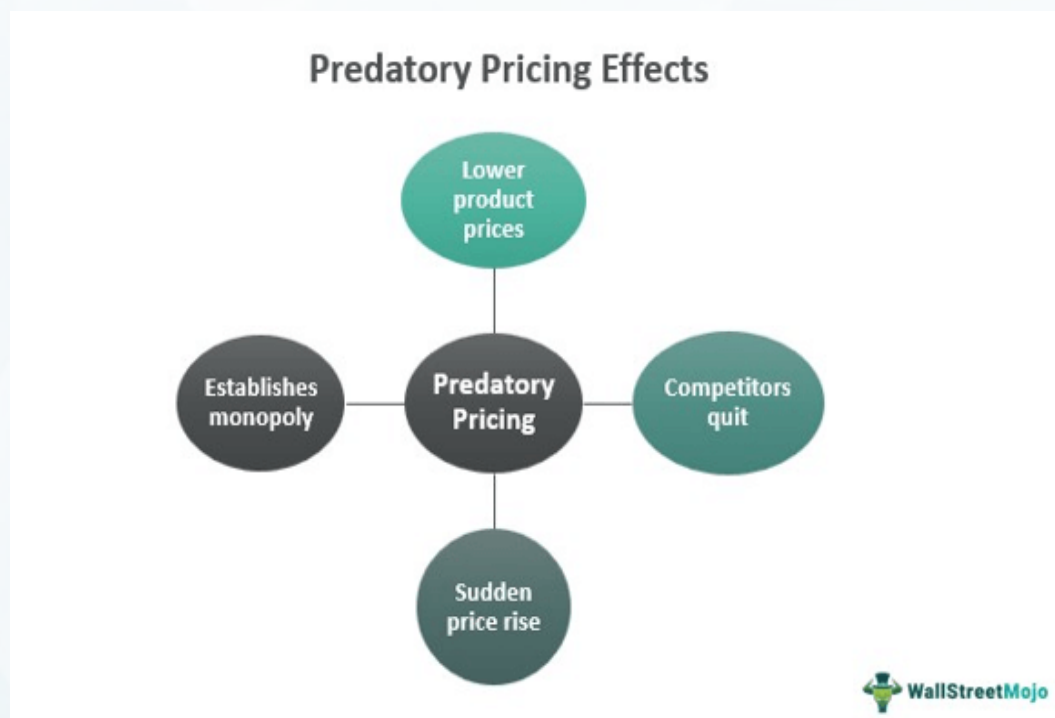
## Predatory Pricing in India

**Relevance for Prelims:** Predatory Pricing, Competition Commission of India

**Relevance for Mains:** Monopsony

Predatory Pricing is an act of reducing the prices of products drastically to eliminate competition. Recently many E-Commerce companies like Shoppe, Amazon, and Flipkart have been allegedly involved in this Pricing to carve out a bigger market share by offering huge discounts.

This creates a Monopsony condition where there are only buyers who are buying all the products at the decreased margin and selling through multiple channels to eliminate the prevailing competition.



Predatory Pricing

### PROBLEM WITH PREDATORY PRICING

**ASYMMETRIC REPERCUSSIONS:** The consumers may get benefit from the decreased prices but on the same hand it has affected the livelihoods of millions of brick-and-mortar shops that buy the product at a limited margin and sell with marginal profit.

**WIDENS SOCIAL DISPARITIES:** Access to the capital with Multi-National Companies like Amazon and Shopee puts them in the front seat in buying products at large scale which further causes deepening the gap.

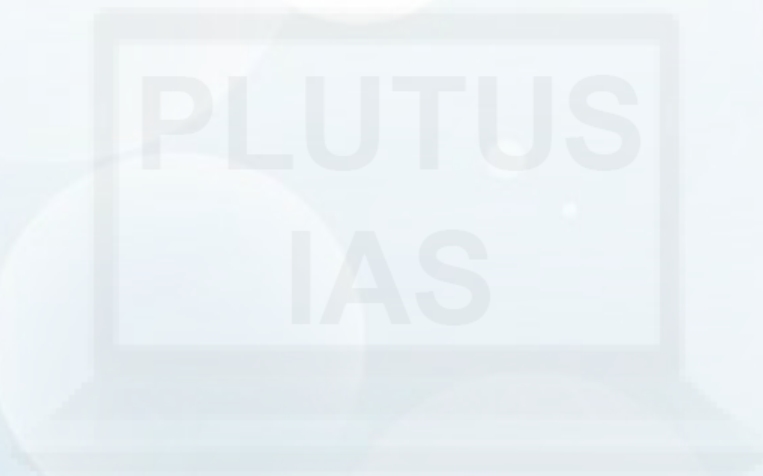
**ANTI-COMPETITIVE:** Recently, many distributors in Maharashtra alleged unfair treat-



ment by Colgate with respect to Business-to-Business Companies like Jiomart which buys the same toothpaste at 30% less price for what is being paid by Distributors. This makes the market anti-competitive.

To restrict this practice, E-Commerce Rules 2021 have put a ban on Flash Sales or back-to-back sales to create a level playing field. The Rules also mandate that none of the related parties are allowed to use any consumer information for unfair advantage.

In 2019, the Competition Commission of India held Google guilty of misuse of its dominant position in the search engine marketplace. Under the Indian jurisprudence, Anti-Trust laws consider predatory pricing as discriminative and unfair under section 4 of the CCI Act, 2002. Strengthening the laws will not only prevent predacious pricing but will create a conducive environment for the business ecosystem.



## Global Risks Report 2023

*This article covers “Daily current events” and the topic is ‘Global Risks Report 2023’ which is in news, it covers the “Indian Economy” In GS-3, and the following content has relevance for UPSC.*

**For Prelims:** About Polycrisis, Global risks report 2023

**For Mains:** GS-3, Indian Economy

### WHY IN NEWS:

In its “Global Risks Report 2023,” the World Economic Forum forewarned that the Russia-Ukraine war could lead to several crises around the world.

### ABOUT POLYCRISIS

- The French complexity theorist Edgar Morin coined the term “polycrisis” in the 1990s.
- When numerous crises in numerous global systems become causally intertwined in ways that drastically worsen the prospects for humanity. If their host systems weren’t so intricately linked, these interacting crises would do more harm than the total harm they would individually.
- Former European Commission President Jean-Claude Juncker coined the term “polycrisis” to describe Europe’s explosive position in 2016, which included debt with Brexit, climate change, and a refugee crisis.

### POLYCRISIS BY WORLD ECONOMIC FORUM

- A collection of threats that feel both entirely new and uncannily familiar are being faced by the world, according to the report.
- A polycrisis could result from the interaction of several dangers, some of which are more established and well-known and others that are new and emergent.
- Older risks: These include inflation, a crisis in the cost of living, trade disputes, capital flight from emerging countries, a large-scale civil upheaval, geopolitical conflict, and the threat of nuclear war.
- Recent changes: Among them are unmanageable debt levels, a new era of slow growth, low global investment, deglobalization, a reduction in human development, and the intensifying effects of climate change.

## GLOBAL RISKS ACCORDING TO THE REPORT

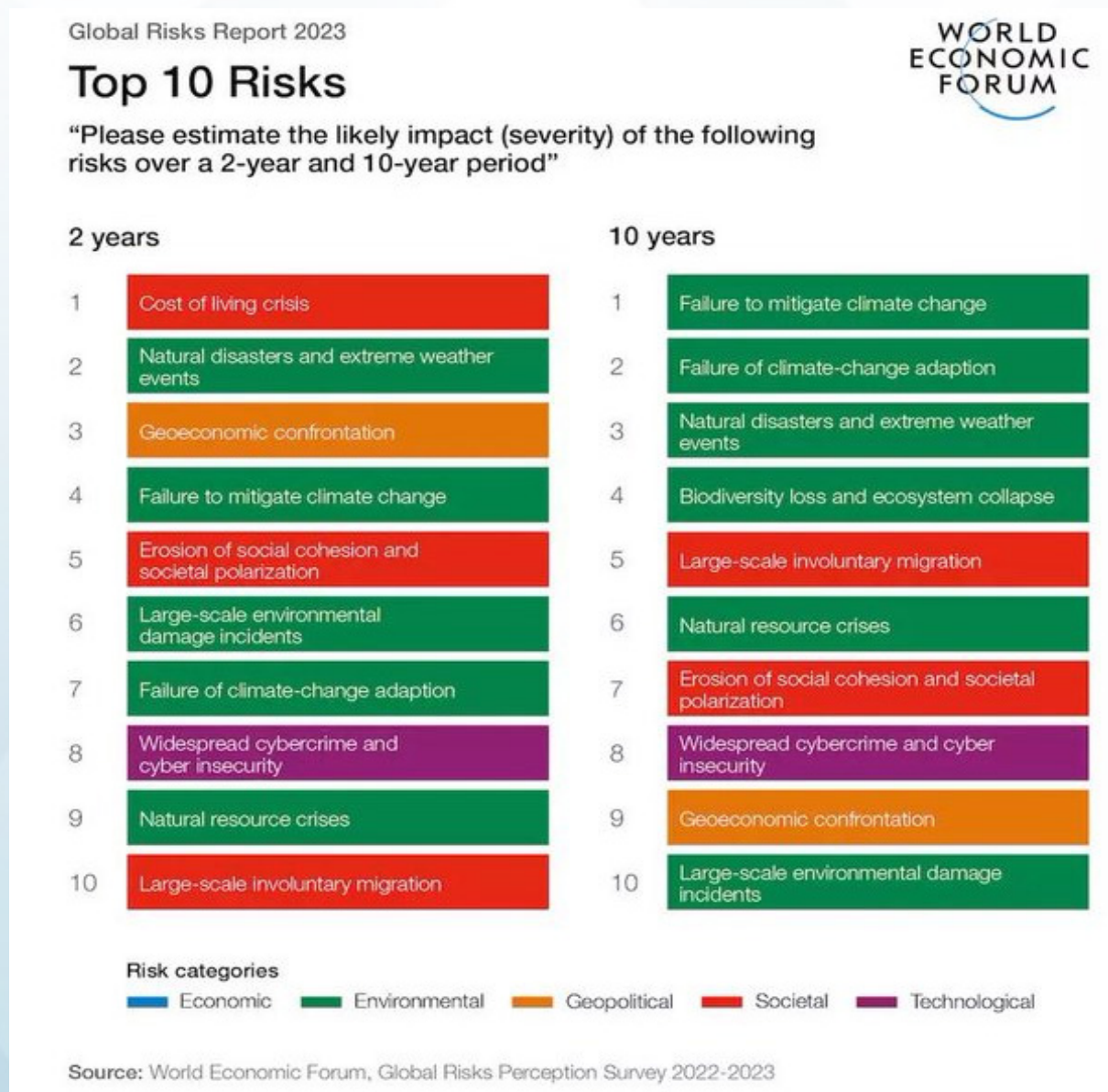
- Short-term risks:

It includes escalating living expenses, sluggish economic expansion, and limited global food and energy supplies.

- Long-term hazards:

It includes the failure to adapt to climate change, the failure to prevent it, extreme weather occurrences, and the prospect of the extinction of species.

The research says that by the end of the decade, these risks could combine into a poly-crisis.



Global Risks Report 2023

## **THE CAUSES OF THESE RISKS**

### **Current events**

Energy and food prices skyrocketed as a result of the conflict in Ukraine. A global cost-of-living problem that resulted from the ensuing inflationary pressures sparked societal discontent.

The globe is currently dealing with a remarkable variety of crises at once, from the COVID-19 pandemic's reverberating effects to global wars and conflicts, from high inflation and slow economic growth to increasingly catastrophic weather phenomena.

Additionally, as economies recovered from the pandemic, carbon emissions grew further.

### **CONSTANT OCCURRENCES**

Due to population expansion and socioeconomic progress, there is an increase in the need for food, water, and energy.

The growth of renewable energy systems is driving an enormous demand for rare minerals and metals.

The mismatch between supply and demand for certain resources could have disastrous effects, such as ecological collapse, trade wars, and interstate warfare.

The report outlines four scenarios that could result in a humanitarian and ecological crisis, ranging from water wars and famines to continued overexploitation of ecological resources and a delay in climate mitigation and adaptation. These scenarios center on food, water, metals, and mineral shortages.

### **OBSERVATIONS BASED ON THE GLOBAL RISKS REPORT**

Similar foresight exercises might assist foresee potential links, guiding preparatory actions towards decreasing the extent and scope of polycrises before they happen, given the unclear relationships between global hazards.

In such a circumstance, many governments have shifted their priorities to address immediate threats, such as food or energy shortages, at the expense of disregarding climate change and global development when they are most necessary.

It calls on world leaders to address the problem of trust erosion. "Addressing the erosion of trust in multilateral processes will strengthen the safeguards we have in place to address well-established dangers and enhance our collective ability to prevent and respond to emerging cross-border crises,".

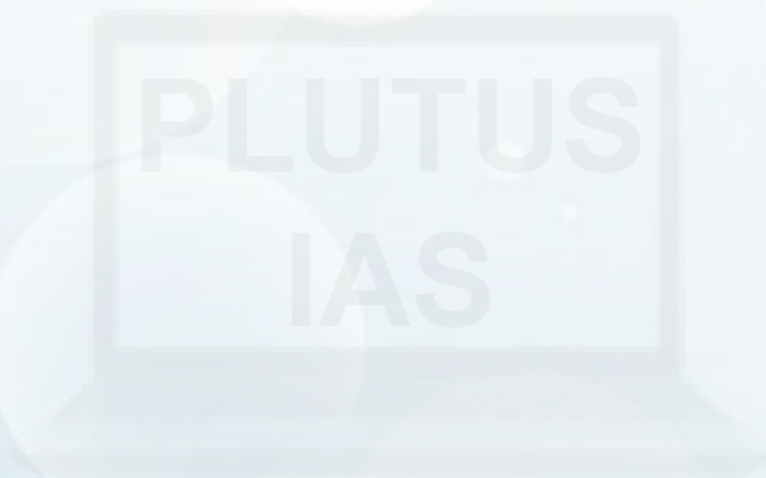
In order to create a road toward a more optimistic, inclusive, and stable world, it fur-



ther calls for leaders to act jointly, decisively, and with a long-term perspective.

**OTHER REPORTS PUBLISHED BY WEF ARE:**

- Energy Transition Index.
- Global Competitiveness Report.
- Global IT Report
- WEF along with INSEAD, and Cornell University publishes this report.
- Global Gender Gap Report.
- Global Risk Report.
- Global Travel and Tourism Report.



## AT1 Bonds

*This article covers "Daily current events" and the topic is about 'AT1 bonds' which are in news, it covers the "Indian Economy" In GS-3 and the following content has relevance for UPSC.*

**For Prelims:** Facts about AT1 Bonds, Basel-3 norms

**For Mains:** GS-3, monetary policy

### WHY IN NEWS:

The write-off of Yes Bank Ltd.'s Additional Tier-1 (AT1) bonds was recently overturned by the Bombay High Court on Friday. The bank facilitated the sale of AT1 bonds from institutional investors to individual investors, according to a Sebi inquiry.

It was determined that individual investors were not made aware of all the risks associated with purchasing AT1 bonds during the sale process.

Super FD and "as safe as FD": According to the Sebi inquiry, Yes Bank misrepresented these bonds to investors as being "Super FD" and "as safe as FD."

Bonds were sold irresponsibly, according to SEBI, which also discovered that Yes Bank's managing director had pushed the institution to lower the price at which it was selling the AT1 bonds.

### ABOUT AT1 BONDS

Perpetual bonds, also known as AT1 bonds, have a call option but no set maturity date. If the bond's issuer can obtain funds at a lower cost, particularly when interest rates are lowering, it may call or redeem the bond. They are identical to other bonds issued by banks and enterprises but have a little higher interest rates. In order to increase their core capital base and comply with Basel-III standards, banks issue these notes.

The exchanges also list and trade these bonds. Therefore, if a holder of an AT-1 bond needs cash, he can sell it on the secondary market. These bonds cannot be returned to the issuing bank and received in whole by the investor. Therefore, its holders do not have access to a put option. Banks that issue AT-1 bonds have the option to forego interest payments for a specific year or even lower the bonds' face value.

The Reserve Bank of India is in charge of regulating AT-1 bonds (RBI). The RBI may simply request that a bank write off its existing AT-1 bonds without first seeking investor consent if it believes the bank needs to be saved.

### DETAILS ON AT1 BONDS

A bond is just a company's loan to itself. The company receives funding from investors

who purchase its bonds rather than a bank.

### **INTEREST COUPON**

The interest coupon is the annual interest rate paid on a bond stated as a percentage of the face value that the company gives in exchange for capital.

### **INTEREST**

The lender reimburses the principal on the loan's maturity date and pays the interest at regular intervals (often annually or semiannually).

### **SIGNIFICANCE**

The bond market can assist investors in diversifying outside of stocks. Bonds can be identified by their maturity, coupon (interest) rate, tax status, and callability, among other attributes.

### **VARIOUS BOND TYPES**

#### **CENTRAL GOVERNMENT BONDS**

Because the government issued these bonds, the government is guaranteeing them. They are among the safest bonds because of this. However, because of their prolonged age, these bonds are vulnerable to the danger of inflation.

#### **STATE GOVERNMENT BONDS**

State Development Loans are another name for state government bonds (SDLs). They are issued by state governments to pay for infrastructure improvements within the state or in times of financial stress, among other uses.

#### **PUBLIC SECTOR BONDS**

These bonds are typically issued by prestigious public sector businesses or organizations to finance their expansion and growth requirements. Compared to corporate bonds, they pose a smaller risk.

#### **CORPORATE BONDS**

Private businesses are the ones that issue corporate bonds. They account for a sizable percentage of the bond market.

### **BASEL III STANDARDS**

- It is an international regulatory agreement that implemented a number of reforms meant to enhance the supervision, regulation, and risk management of the banking

industry following the 2008 financial crisis.

- The Basel-III standards required banks to retain a minimum amount of capital and refrain from lending all of their deposit-derived income.
- Regulation capital for banks is split into Tier 1 and Tier 2 in accordance with Basel-III standards, with Tier 1 capital further broken into Common Equity Tier-1 (CET-1) and Additional Tier-1 (AT-1) capital.
- Equity instruments that have returns correlated with bank performance and, consequently, share price performance are included in common equity Tier 1 capital. They are immature.
- CET and AT-1 are referred to as Common Equity. Minimum Common Equity Capital Requirements have been established under Basel III regulations.
- Unsecured subordinated debt with an original maturity of at least five years makes up Tier 2 capital.
- In accordance with the Basel standards, these bonds may be written off if the required minimum Tier-1 capital falls below 6%.



## Status of Rubella and Measles in India

*This article covers “Daily current events “and the topic is about ‘rubella and measles’ which is in news, it covers “Science and technology and Health” In GS-2, and GS-3, the following content has relevance for UPSC.*

**For Prelims:** About Rubella and measles

**For Mains:** GS-2, GS-3 ,Health and science and technology

### WHY IN NEWS:

India declared a goal to eradicate measles and rubella (MR) by 2023 after missing the previous deadline of 2020 for several reasons, some of which were made worse by the pandemic's interruptions.

India set the goal of eradicating MR by 2023 in anticipation that the 2020 target would not be feasible.

### ABOUT RUBELLA AND MEASLES

#### MEASLES

- It is a viral disease that is extremely contagious and kills young children all over the world.
- A single-stranded, encapsulated RNA virus with one serotype is the culprit. It is categorized as a member of the family Paramyxoviridae's genus Morbillivirus.
- Since it targets children who are malnourished and have weakened immune systems, it is especially harmful to youngsters from disadvantaged economic backgrounds.
- Blindness, encephalitis, severe diarrhea, ear infections, and pneumonia are just a few of the terrible problems it can bring on.
- A safe and effective vaccination is currently available, but measles still claims the lives of thousands of youngsters each year throughout the world.
- Young children make up the majority of the fatalities.
- The paramyxovirus family includes the measles virus, which is often spread through direct contact with the air.
- Measles mortality decreased by almost 73% between 2000 and 2018 thanks to intensive vaccination campaigns conducted worldwide.
- Measles symptoms often start 10 to 12 days after the infection. The typical signs include:

- high fever
- clogged nose
- red eyes
- Little white dots on the mouth's interior
- Rashes that extend downward from the face and upper neck (this appears after several days)

### **VACCINE FOR MEASLES**

- This vaccination, known as the MMR, protects against measles, mumps, and rubella.
- MMR is administered twice, once at 12 to 15 months and once around 4 to 6 years of age.
- Teenagers and adults can receive the MMR vaccine as needed.

### **RUBELLA**

- It is also known as German Measles or Rubella.
- Rubella is a contagious, mostly minor viral infection that primarily affects children and adolescents.
- The single-stranded RNA virus with an envelope that causes it is called the rubella virus.
- Pregnant women who contract rubella may lose their lives or give birth to children who have Congenital Rubella Syndrome (CRS), an untreatable birth condition.
- Although rubella is distinct from measles, the two diseases have significant similarities, such as the red rash.
- Rubella is not as contagious or dangerous as measles since it is caused by a different virus.

### **THE SITUATION OF MEASLES AND RUBELLA IN THE WORLD AND IN INDIA**

- According to the World Health Organization, rubella is a major vaccine-preventable cause of birth abnormalities and the measles virus is one of the most contagious human viruses in the world, killing more than 100,000 children annually (WHO).
- According to figures from the WHO, during the past 20 years, the measles vaccination is thought to have prevented more than 30 million deaths worldwide.
- India vaccinated around 119 million children in 14 States between 2010 and 2013

as part of a phased measles catch-up immunization program for children aged 9 months to 10 years.

- In 2014, Mission Indradhanush was established to increase vaccination rates among the unvaccinated.
- India developed a national strategic plan for the eradication of measles and rubella from 2017 to 2021.
- The government added the rubella-containing vaccine (RCV) to the regular immunization schedule during this time.
- As of December 2021, Bhutan, DPR Korea, the Maldives, Sri Lanka, and Timor-Leste have all been confirmed as having eliminated measles. Maldives and Sri Lanka have also maintained their status as countries that eradicated rubella in 2021.

### **WHAT ARE THE MR PREVENTION MEASURES:**

#### **GOVERNMENT PROGRAMS:**

#### **VACCINATION FOR MEASLES AND RUBELLA**

- The MR Immunization Program was introduced in 2017 by the Ministry of Health and Family Welfare.
- The largest-ever effort, the MR campaign targets about 41 crore youngsters nationwide.
- No matter whether they have ever received the measles/rubella vaccination or have ever had the disease, all children between the ages of 9 months and under 15 receive a single dose of the MR vaccine.
- All fifty states offer the MR vaccination free of charge.
- UIP, Mission Indradhanush, and Intensified Mission Indradhanush are some further initiatives.
- The MR campaign, the largest ever in any campaign, aims to reach around 41 crore youngsters nationwide.
- Measle-rubella (MR), measles-mumps-rubella (MMR), and measles-mumps-rubella-varicella (MMRV) combination vaccines are available to prevent infections.

# KEN BETWA LINK PROJECT

## KEN BETWA LINK

*This article covers “Daily current events” and the topic is about the ‘Ken betwa link’ which is in news, it covers the “Infrastructure” In GS-3, and the following content has relevance for UPSC.*

**For Prelims:** About Ken Betwa interlinking project

**For Mains:** GS-3 Issues associated with Ken Betwa river interlinking project

## WHY IN NEWS:

- The Ken Betwa Link Project (KBLP), which the Ministry of Jal Shakti recently presided over a meeting on, is described as the national government’s “flagship project” and is “critical for the water security and socioeconomic development of the Bundelkhand region.”
- The Union Cabinet approved the KBLP in December 2021 for Rs 44,605 crore. in this undertaking.
- Political and environmental concerns have caused the project to be delayed.

## ABOUT KEN-BETWA LINK

- Aiming to transmit extra water from the Ken River in Madhya Pradesh (MP) to Betwa in Uttar Pradesh (UP) to irrigate the drought-prone Bundelkhand region, the Ken Betwa Link Project (KBLP) links two rivers.
- The region is primarily comprised of the MP districts of Tikamgarh, Panna, and Chhatarpur, as well as the UP districts of Jhansi, Banda, Lalitpur, and Mahoba.
- The project is for constructing a 230 km canal, a 77-meter-tall Dhaudhan dam (to be erected within Panna Tiger Reserve), and a 2 km broad dam.
- One of the 30 river interlinking projects planned across the nation is called Ken-Betwa.
- Meaning: By building a multipurpose dam, not only will water conservation be accelerated, but 103 MW of electricity will also be generated, and 62 lakh people will have access to clean water.

## BACKGROUND OF KEN-BETWA LINK PROJECT

- In August 2005, the governments of Madhya Pradesh and Uttar Pradesh signed a tripartite agreement of understanding for the creation of a detailed project report

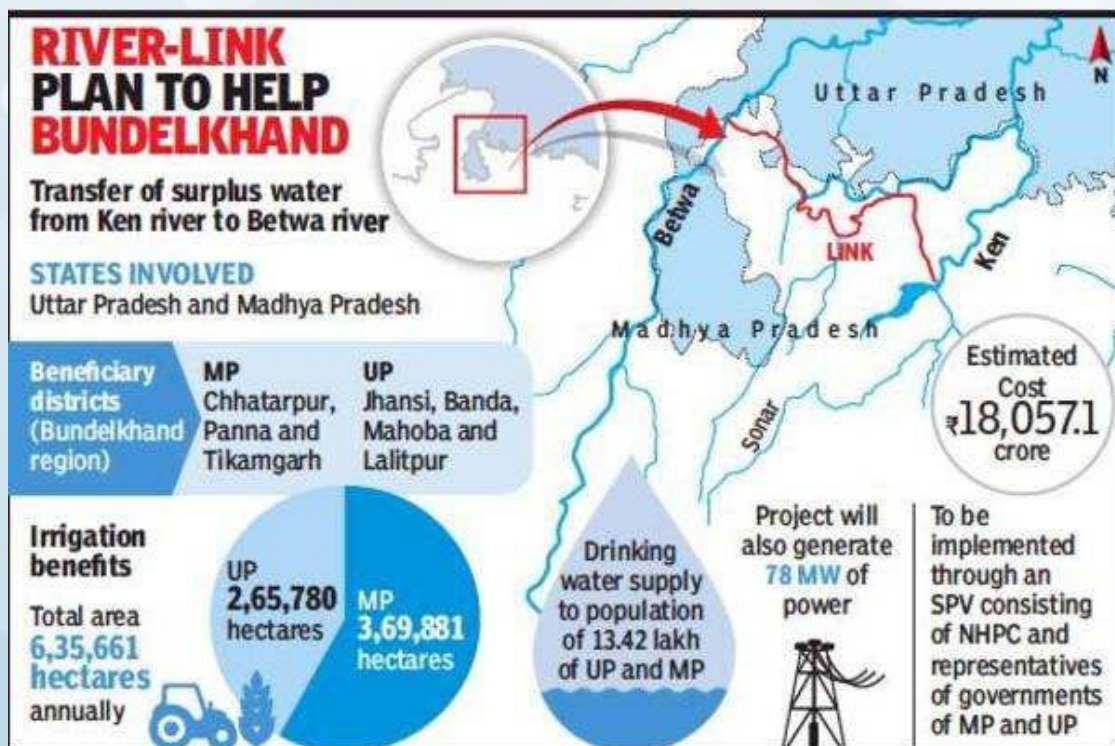


(DPR), which gave the notion of connecting Ken with Betwa a significant boost.

- The Center designated KBLP a National Project in 2008. Later, it was incorporated into the prime minister's development plan for the region of drought-prone Bundelkhand.
- The Ministry of Jal Shakti and the two states signed a memorandum of understanding in 2021 to implement this initiative.

## EXECUTING ORGANIZATION

- The project will be carried out by the Ken-Betwa Link Project Authority (KBLPA), a Special Purpose Vehicle (SPV).
- To carry out the project, the Link Project Authority (KBLPA) will be established.
- For specific connection projects, the National Interlinking of Rivers Authority (NIRA) has the authority to create an SPV.
- Project's phases include: The project has two phases and essentially consists of four parts.
- One of the parts—the Daudhan Dam complex and its ancillary units, including the Low-Level Tunnel, High-Level Tunnel, Ken-Betwa Link Canal, and power plants—will be the focus of Phase I.
- Three parts will make up Phase II: the Lower Orr Dam, the Bina Complex Project, and the Kotha Barrage.



## **KEN BETWA LINK**

### **PROJECT-RELATED CONCERNS**

- **Environmental:** Due to issues over ecology and wildlife conservation, such as the project's passage through a tiger reserve's essential habitat, Despite the project's passage through a crucial tiger habitat in the Panna Tiger Reserve, the National Green Tribunal (NGT) and other higher authorities have not yet given its clearance.
- **Panna Tiger Reserve Submergence:** The National Water Development Agency states that the reservoir of the Daudhan dam will "involve a submergence of 9000 ha land, of which 5803 ha comes inside Panna Tiger Reserve" (PTR).
- **Three Wildlife Sanctuaries (WLS),** namely Nauradehi, Rani Durgawati of MP, and Ranipur WLS of UP, are scheduled to be integrated with PTR in order to lessen this.
- **Economic:** Project implementation and maintenance come at a significant financial expense that has been increasing as a result of delays.
- **Social:** There will be social costs associated with the reconstruction and rehabilitation needed as a result of the project's displacement.
- They worry that the project will jeopardise Panna's access to water.
- **Legal:** The approval given to the KBLP also has substantial legal issues.
- It has not been established that approval of the Ken-Betwa connection Project by the Standing Committee of the National Board for Species is required for the improvement and better management of the wildlife there, as stated in Section 35(6) of the Wildlife (Protection) Act, 1972.

### **BENEFITS**

- The project is located in the Bundelkhand region, which spans 13 districts in Uttar Pradesh and Madhya Pradesh and is prone to drought.
- The Jal Shakti Ministry claims that the project will be extremely helpful to this area that lacks access to water.
- Additionally, it will open up opportunities for other river projects to be connected, preventing water shortages from impeding national development.
- The project is anticipated to produce 103 MW of hydropower and 27 MW of solar power, as well as offer yearly irrigation for 10.62 lakh hectares and drinking water for around 62 lakh people, according to the Jal Shakti Ministry.

## **ABOUT THE NATIONAL PERSPECTIVE PLAN FOR RIVER INTERLINKING**

- The National River Linking Project (NRLP), formerly known as the National Perspective Plan, envisions the transfer of water through inter-basin water transfer projects from water “surplus” basins where there is flooding to water “deficit” basins where there is drought/scarcity.
- The National Water Development Agency (NWDA) has designated 30 links under the National Perspective Plan (NPP) for the creation of feasibility reports, 16 under the Peninsular Component, and 14 under the Himalayan Component (FRs).
- In August 1980, the NPP for moving water between basins with water surpluses and deficits was created.

## **WAY AHEAD**

- A case-by-case analysis should be used to determine whether river interlinking is necessary and feasible, with a focus on resolving any federal issues that may arise.
- Restructure the water sector’s public-private partnerships and water prices to at least recover operation and maintenance expenditures.
- A community-based participatory method to promote behavioral modifications and groundwater management.

## Skyglow: Light pollution

*This article covers "Daily current events "and the topic is" Skyglow" which is in news, it covers the "Environment and ecology" In GS-3, the following content has relevance for UPSC.*

**For Prelims:** About Skyglow, light pollution,

**For Mains:** GS-3, Implications of Skyglow

### WHY IN NEWS:

- The brightness of Skyglow has recently been determined to have grown due to artificial lighting by 9.2-10% annually between 2011 and 2022, with severe ecological, health, and cultural ramifications.
- A global database that contained more than 51,000 entries contributed by citizen scientists and listed the dimmest star that may be seen from a specific place has been examined by researchers.

### ABOUT SKYGLOW

- The Skyglow, which blankets the night sky above and around towns and can obscure all but the brightest stars, is a constant sheet of light.
- It is caused by the brightening of the night sky over populated areas brought on by streetlights, security floodlights, and outdoor decorative lights.
- The Nocturnal (active at night) are blinded by this light, which also floods into the heavens and distorts their course.
- One element of light pollution is "skyglow."

### SKYGLOW SCENARIO ENTAILS

#### Global

- Over Europe, the Skyglow had brightened by around 6.5%, over North America by about 10.4%, and over the rest of the planet by about 7.7%.
- The result is noteworthy since it contradicts satellite-based statistics that suggested the rate of rise had been roughly 2% annually.
- The mismatch is most likely due to the satellites' inability to detect blue LED light and analyze light that is emitted perpendicular to the ground.



## India

- According to a 2016 study, 19.5% of Indians live in a country with the least amount of skyglow among the G20 nations, which would at the very least prevent viewing of the Milky Way galaxy and, at the very worst, prevent “dark adaptation for human eyes.”
- One of the results is the stimulation of cone cells in the human eye, which is only feasible in well-lit environments.
- According to a 2017 study, between 2012 and 2016, India’s illuminated area expanded by 1.07 to 1.09%, and the average radiance of “stably lit areas” — i.e., places that aren’t affected by wildfires — increased by 1.05 to 1.07%.
- It affects all elements of insect life and prolongs the hunting season for bug predators, according to a study from 2020.
- Using artificial light at night can hinder the body’s ability to produce melatonin, a key hormone that influences sleep, mood, and cognition, according to a study published in 2020.

## IMPACT OF LIGHT POLLUTION

### Energy and financial waste:

It is inefficient to have lighting that shines when and where it is not needed, or that emits too much light. Energy waste has severe economic and environmental repercussions.

## ECOSYSTEM DISRUPTION AND WILDLIFE EXTINCTION

- Plants and animals rely on the earth’s daily cycle of light and dark to guide life-sustaining behaviors including reproduction, nutrition, sleep, and protection from predators.
- According to scientific data, nighttime artificial light has harmful and fatal impacts on a variety of animals, including amphibians, birds, mammals, insects, and plants.
- Ex: Sea turtles are discouraged from nesting on beaches that are lit. Skyglow prevents trees from detecting seasonal changes.
- When clownfish eggs are exposed to artificial light at night, they do not hatch, killing the young.

## NEGATIVE EFFECTS ON HUMAN HEALTH OF LIGHT POLLUTION

- Humans have a circadian rhythm, or biological clock, that is dictated by the day-

night cycle, just like the majority of life on Earth. That cycle can be broken at night by artificial light.

- A small 2009 assessment found that night shift workers had a 40% higher risk of breast cancer due to circadian disturbance, which can be brought on by changed melatonin levels.
- The destruction of the night sky works as a type of continuous cultural and ecological genocide by erasing Indigenous people's connection to the stars.

#### **Light pollution:**

- Inappropriate or excessive use of artificial light also referred to as LP, can have negative effects on the environment that affect people, wildlife, and our climate.
- Light pollution has several factors,
- including:
  - **glare:** excessive brightness that impairs vision
  - **skyglow:** The sky over populated regions will sparkle at night.
  - **Light intruders:** Light that shines where it isn't wanted or needed
  - **Clutter:** Bright, illogical, and crowded collections of light sources.
- **Causes:**
- LP is a byproduct of modern industrial civilization.
- Advertising, commercial buildings, offices, industries, streetlights, and illuminated athletic venues are a few of its sources, as well as the interior and external illumination of buildings.

Light pollution

#### **WAY AHEAD**

- Over 130 "International Dark Sky Places," where artificial lighting has been modified to lessen skyglow and light trespass, have been certified by the International Dark-Skies Association. However, the majority are in northern hemisphere developed nations.
- The chance to engage in lighting solutions before animals there are substantially harmed is presented by the fact that less developed areas are frequently both species-rich and currently less light-polluted.
- The scientists advise using light sources that cast light at an angle below the horizon,

capping their emissions, and adjusting their output by the overall brightness of the area being illuminated.

- Where lights cannot be turned off, they can be shaded to prevent light pollution of the surroundings and the sky.





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