

CORPORATE OFFICE

Delhi Office

706 Ground Floor Dr. Mukherjee
Nagar Near Batra Cinema Delhi -
110009

Noida Office

Basement C-32 Noida Sector-2
Uttar Pradesh 201301

CURRENT AFFAIRS

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INDIA TO JOIN SKA OBSERVATORY AS A FULL MEMBER.

This article covers 'Daily Current Affairs' and the topic details of 'India's participation in the Square Kilometer Array (SKA) Project.' This topic is relevant in the "Science and Technology" section of the UPSC CSE exam.

UPSC Mains GS-3 Syllabus : Achievements of Indians in Science & Technology, Space Technology

Why in the News?

The Government of India has approved the participation of India in the international science project, Square Kilometre Array (SKA), at a cost of ₹ 1250 Cr. This clearance covers funds for the international SKA Observatory (SKAO) construction phase for the next seven years.

About SKAO

- SKAO is an intergovernmental organisation dedicated to the construction and operation of sophisticated radio telescopes. Its global headquarters are at the Jodrell Bank Observatory in the United Kingdom.
- The SKAO is a network of thousands of antennas that will be deployed in remote areas of Australia and South Africa.
- The SKA project will be built in two parts, the first of which began in December 2022 (SKA1).
- SKA1 is scheduled to start operations in 2029.
- The UK, Australia, South Africa, Canada, China, France, India, Italy, and Germany are among the countries involved in the SKA's construction.

India's participation in SKAO :

- Since its inception in the 1990s, India has played an important part in the progress of the SKAO project, through the Pune-based National Centre for Radio Astrophysics (NCRA) and other institutes.
- Within the SKA, NCRA was given charge of the successful construction and operation of the Giant Metrewave Radio Telescope (GMRT).

Importance of SKA telescope :

It aspires to answer basic astrophysical, cosmological, and astrobiological problems. These include the origins of interstellar magnetism, the nature of dark matter and dark energy, and the search for extraterrestrial life. Some other questions scientists hoping to be answered by SKA are :

1. The origins of the universe,

2. The birth of the first stars
3. A galaxy's life span,
4. Investigating the prospect of discovering technologically advanced civilizations elsewhere in our galaxy
5. Tracing the origins of gravitational waves.

SKA Telescope Design and Features :

- A radio telescope's essential components generally comprise a 'big parabolic dish' or a collection of smaller dishes that gather and focus incoming radio waves, a 'receiver' that converts radio waves into electrical signals, and a computer unit that processes and analyses the data. The dish or array is frequently installed on a moveable construction, allowing astronomers to position the telescope towards various portions of the sky.
- In South Africa, the SKA will consist of 197 parabolic radio antennas.

What is a Radio telescope ?

1. A radio telescope is a type of telescope that detects and collects radio waves emitted by celestial objects.
2. Radio telescopes, as compared to optical telescopes, are designed to capture radio waves emitted by astronomical objects.
3. The wavelengths of radio waves are longer than those of visible light, ranging from a few millimetres to several metres.
4. Radio telescopes, contrary to optical telescopes, can be utilised both during the day and at night.
5. Radio telescopes are essential for analysing astronomical phenomena like pulsars, quasars, galaxies, and cosmic microwave background radiation. They provide insightful data about the universe, particularly on radio-emitting objects and processes.
6. Astronomers can examine celestial phenomena and processes that are not visible in the optical spectrum by observing in the radio frequency range.

Some major Radio Telescopes are :

- Five-hundred-meter Aperture Spherical Telescope (FAST) : China
- Green Bank Observatory (GBT) : USA
- Giant Metrewave Radio Telescope (GMRT) : India
- Atacama Large Millimetre/submillimetre Array (ALMA) : Chile
- Yevpatoria RT-70 : Ukraine

Conclusion :

India's participation in the Square Kilometre Array Observatory project provides prospects for technological growth, worldwide cooperation, talent development, and a boost in India's reputation in the international scientific community rather than just another tool for scientific exploration.

Prelims practice questions

- Q1) When it comes to studying astronomical objects, what advantages do radio telescopes have against optical telescopes?
- a. Improved resolution
 - b. The ability to see through clouds and interplanetary dust
 - c. Increased sensitivity to visible light

d. Increased magnification

Answer: **B**

Q2) What is the objective of a radio telescope's "dish" or "parabolic reflector"?

- A. To improve radio signals
- B. To steer radio waves towards the receiver
- C. To produce radio signals
- D. To eliminate interference from the Earth's atmosphere

Answer: **B**

Mains practice questions :

- Q1) Examine the major contributions of the Giant Metrewave Radio Telescope (GMRT) in India to astronomy. Discuss its unique features and capabilities.
- Q2) What are the challenges and benefits of performing radio astronomy experiments in India, while taking into account considerations such as geographical position, interference, and collaborations with international observatories?

Himanshu Mishra

EUROPEAN UNION'S CARBON BOUNDARY ADJUSTMENT MECHANISM (CBAM)

Source - Editorial of 'The Hindu' and a brief summary of PIB.

GENERAL STUDIES: CLIMATE CHANGE, SUSTAINABLE DEVELOPMENT, INTERNATIONAL RELATIONS, CONTINUOUS DIMENSIONS OF ECONOMY, EMISSION TRADE SYSTEM (ETC), GREENHOUSE GAS EMISSIONS, CARBON LEAKAGE, WORLD TRADE ORGANIZATION LAW.

WHY IN THE DISCUSSION / NEWS ?

Climate change is a global problem that requires immense resolution globally. Under the '**Carbon Border Adjustment Mechanism-CBAM**) by the European Union (European Union- EU) on the import of goods created using fossil fuels, non-green or environmentally unstable technologies, now under carbon tax It will be imposed, which will be implemented in a phased manner from October 2023. The European Union itself is very ambitious about climate change policy, and as long as there are low rigid climate policies in many non-European Union countries, there is always a danger of 'carbon leakage'. Carbon leakage occurs when companies located in the European Union take carbon-fingered production to countries abroad where less rigorous climate-change policies apply, or when European Union's products are more carbon. The intensive imports are replaced.

- **European Carbon Border Adjustment Mechanism (CBAM)** Initially some selected items whose carbon emissions in the production process are quite intensive and which has the most important risk of carbon leakage: eg – cement, iron and steel, aluminum, fertilizer, electricity and The imports of hydrogen etc. will be applicable only.
- From January 1, 2026, the CBAM will charge 20 to 35% carbon tax on the imports produced in the European Union.

WHAT IS THE CARBON LIMIT ADJUSTMENT MECHANISM ?



INTRODUCTION TO CARBON BORDER ADJUSTMENT MECHANISM :

- The European Carbon Border Adjustment Mechanism (CBAM) is a strategy of the European Union to follow the European Climate Change by cutting at least 55% in greenhouse gas emissions by 2030 in the direction of climate change. CBAM is also a component of the **“Fit for 55 in 2030 package”**.
- CBAM is a policy tool that aims to ensure that carbon -emissions in the European Union are subjected to carbon costs similar to the products produced within the European Union countries.

WHAT IS THE REASON FOR IMPOSING A CARBON TAX ?

- **The European Union has announced a reduction of at least 55 per cent in its carbon emissions by 2030 compared to the level of 1990. So far, there has been a fall of 24 per cent in them. However, imports from imports contribute 20 per cent to carbon dioxide (CO2) emissions by the European Union, with further increase.**

WHAT IS THE ISSUE ?

- The group of **‘Basic’ countries (Brazil, South Africa, India and China – Brazil, South Africa, India, China)** protested against the European Union’s proposal in a joint statement that – **“ It is against ‘discriminatory’ and equality and ‘equal but different responsibilities and related abilities’ (CBDR-RC) theory. These principles admit that developed countries are responsible for providing financial and technical assistance to developing and sensitive countries to combat climate change. ”**

THE MAJOR OBJECTIVE OF THE CARBON BORDER ADJUSTMENT MECHANISM :

- **The main objective of the carbon boundary adjustment mechanism by the European Union is to encourage clean fuel production in the world to ensure that the goals set for climate change do not fall into intensive imports of carbon – emissions and the rest of the countries of the world To be encouraged for clean fuel production.**

IMPORTANCE OF CARBON BOUNDARY ADJUSTMENT MECHANISM :

- The carbon border adjustment mechanism of the European Union may encourage non-European Union countries to deal with the dangers of climate change and to keep the environment balanced globally to adopt extremely rigorous stringent environmental regulations, which in global carbon emissions There is a possibility of shortage.
- This can reduce or stop carbon emissions by preventing manufacturing companies from being transferred to countries with less strict rules related to environmental rules.
- Revenue generated from CBAM will be used to support the climatic policies of the European Union, allowing the rest of the world to encourage the use of green energy.

METHODS OF IMPLEMENTATION OF CARBON BORDER ADJUSTMENT MECHANISMS :

- CBAM will be applied to importers on an annual basis to announce the amount of goods imported into the European Union as well as their inherent greenhouse gas (GHG) emissions.
- To offset these emissions, importers will need to surrender a similar number of CBAM certificates, priced at the EU Emission Trading System (ETS) allowance weekly average average auction price per ton of Euro CO2 emissions.

CARBON BORDER ADJUSTMENT MECHANISM

 **Yojna IAS**
yojnasias.com योजना है तो सफलता है

**CBAM WILL
IMPACT OVER
30% OF EXPORTS
FROM INDIA TO
EUROPEAN
UNION!**

ITS IMPACT ON INDIA ?

- The European Union is the third largest trading partner in India. The European Union will make Indian goods less attractive to buyers by increasing the prices of goods made in India, which can reduce demand. This carbon can create serious challenges in the near future for companies with large greenhouse gas footprint. ,

- In addition, it is also against the global consent inherent in Article-12 of the Rio Declaration of the European Union to set uniform standards worldwide for the environment. According to which the applied standards of climate change for developed countries cannot be applied to developing countries.
- It is worth noting that the greenhouse content of these imports will also have to be accommodated in the Greenhouse Gas List of imported countries, for which it is essentially necessary that the greenhouse gas list is not “based on production” but “on consumption”. Should be counted. This will change the entire climate change system. Many experts in the world are also considering this policy as a ‘separate form of protectionism’.
- This protectionism shows government policies that prohibit international -trade to help domestic industries. Such policies are usually applied with the goal of improving economic activities within the domestic economy. The biggest threat to this and the risk is that it becomes a conservationist tool, which prevents local industries from foreign competition by making an excuse for ‘green protectionism’.

ITS IMPACT ON INDIA’S EXPORTS :

- This will adversely affect the export of products such as iron, steel and aluminum to be done between India and the European Union, as they will face additional investigation under this system.
- The business that India exports to the European Union to the European Union is probably affected by the European Union by 19.8% to 52.7% carbon tax.
- The European Union will start charging carbon tax from January 1, 2026 on every consignment of steel, aluminum, cement, fertilizer, hydrogen and electricity, which will have a copy effect in the fields of cement, fertilizer, aluminum, steel, hydrogen and electrical business of India. .

HIGH FEES AND CARBON INTENSITY OF INDIAN PRODUCTS :

- Due to the most use of coal in energy consumption, carbon intensity of Indian products is significantly higher than in other countries. In such a situation, the European Union and India will have widespread and adverse effects on mutual trade relations.
- **The ratio of coal in India is close to 75% of the ratio of coal, which is much higher than the European Union (15%) and the global average (36%).**
- Direct and indirect carbon emissions produced from India’s iron and steel and aluminum plants is a major concern for India because the European Union will have to pay high carbon tax due to high carbon emissions in these industries in India, due to the cost price to the European Union, due to the cost price There is a strong possibility of an increase in.

EFFECT ON INDIA’S EXPORTS AND POTENTIAL THREATS :

- Carbon tax charged by the European Union includes India’s sophisticated petroleum products, organic chemicals, pharma drugs and textiles, etc., which are imported from India by the European Union, will adversely affect the export of 20 products.
- Currently there is no indigenous carbon pricing scheme in India, this causes the risk of increasing mutual competition between companies, because other countries with carbon pricing systems may have to pay minimum carbon tax or they can also get discounts.



STEPS TAKEN BY INDIA TO REDUCE THE IMPACT OF EUROPEAN CARBON BORDER ADJUSTMENT MECHANISM (CBAM) :

DECARBONIZATION THEORY :

- The Government of India already has schemes like 'National Steel Policy'. This **production-based incentive (PLI)** scheme of the Government of India is aimed at increasing India's production capacity, but the current 'National Steel Policy' is beyond the objectives of schemes like carbon proficiency.
- The Government of India can include these schemes with decarbonization theory.
- Decarbonization refers to the process of reducing or eliminating greenhouse gas emissions from human activities such as transport, power generation, construction and agriculture, especially carbon dioxide (CO₂).

AGREEMENT TALKS FOR CARBON TAX DEDUCTION WITH THE EUROPEAN UNION :

- To make its energy taxes equivalent to carbon value, the Government of India can talk with the European Union, which will make India's export sector less sensitive to CBAM.
- India's tax on coal is a way to manufacture the internal cost of carbon emissions, which is equivalent to carbon tax.

MUTUAL TRANSFER OF NEW, ADVANCED AND CLEAN TECHNOLOGIES AND FINANCING SYSTEM :

- One way to help India support climate commitments is to help India support climate commitments to help India be more carbon efficient to transfer new, advanced and clean technologies and financing mechanisms among themselves. It should be proposed to keep it separate.
- The way China and Russia are setting up carbon trading systems, India should also start preparing for the new system in the same way.

ENCOURAGE CLEAN AND GREEN PRODUCTION :

- India should increase the international economic system and its net zero target 2070 without compromising its developmental goals and economic aspirations.
- India should start its preparation in this direction, along with encouraging clean production and moving to achieve the opportunity to make it green and sustainable, which India has both more aware and competitive forms towards carbon emissions in future Will benefit India from

EUROPEAN UNION CARBON TAX (TAX) FRAMEWORK :

- As the **Chief Leader of G-20, 2023, India** should use its position to advocate other countries as the country and host leader and urge them to oppose the Carbon Tax structure of the European Union.

- **European Carbon Border Adjustment Mechanism (CBAM)** will affect the poor countries that are very much dependent on mineral resources. Therefore, India should not only focus on its interests but should also consider its negative impact, so that India can also reconcile with the business and economic interests of the global community.

THE PATH OF CONCLUSION / SOLUTION :

- European Carbon Border Adjustment Mechanism (CBAM) is a policy to reduce carbon emissions from imported goods and create a fair-trade environment. India should increase its pressure on the European Union to make this carbon tax policy extremely flexible.
- This may encourage other countries to reduce strict environmental rules and global carbon emissions.

PRACTICE QUESTIONS FOR PRELIMINARY EXAMINATION:

Q. 1. Consider the following statements in relation to the 'Carbon Border Adjustment Tantra of the European Union.

1. CBAM is a component of "Fit for 55 in 2030 package".
2. The group of 'Basic' countries (Brazil, South Africa, India and China – Brazil, South Africa, India, China) has opposed this regarding carbon tax.
3. From January 1, 2026, the CBAM will charge 20 to 35% carbon tax on the imports produced in the European Union.
4. The European Union's perception to set a uniform standard worldwide for the environment is against the global consent inherent in Article-12 of the 'Rio Declaration'.

Which of the above statements / statements is correct?

- (A). Only 1, 2 and 3
- (B). Only 2, 3 and 4
- (C). None of these.
- (D). All of these.

Answer – (D)

PRACTICE QUESTIONS FOR MAIN EXAM :

Q. 1. A brief discussion of the Carbon Border adjustment mechanism of the European Union, explain how India's interest is affected by it?

Akhilesh kumar shrivastav