

# **UPSC Daily Current Affairs | Prelim Bits 11-06-2024**

# **Ocean Based Carbon Removal**

A new study throws light on the limitations of the current approaches of removing carbon dioxide from the ocean.

• **Carbon sequestration by Ocean** – It has already <u>absorbed 30% of the CO2</u> and <u>90%</u> <u>of excess heat</u> caused by human activities.

In total, the ocean holds around 42 times more carbon than the atmosphere.

• **Approaches** – By enhancing or accelerating natural biological or chemical processes that sequester carbon in the ocean.



Carbon removal approaches in the ocean

- **Abiotic approaches** They <u>harness the physical or chemical</u> properties of the ocean to remove CO2 from the air.
  - Alkalinity enhancement, electrochemical CO2 removal and artificial downwelling
- **Biotic approaches** They *leverage photosynthesizing organisms* in seawater to take up CO2 and *store as biomass*.
  - $\circ\,$  Seaweed cultivation, Ocean fertilization, artificial upwelling and coastal wetland restoration.

#### Abiotic Approaches in Marine CO2 Removal

• **Alkalinity enhancement** – <u>Adding certain minerals</u> to seawater enable more atmospheric CO2 to dissolve into the ocean.

• **Electrochemical CO2 removal -** It <u>use electricity</u> to mimic alkalinity enhancement, or directly extract CO2 from seawater for storage on land.

• Artificial downwelling – It <u>accelerates natural currents</u> that carry carbon-rich surface water into the deep ocean in the Arctic and Antarctic.

Biotic Approaches in Marine CO2 Removal

• **Seaweed cultivation** – They are cultivated and then <u>sunk to the deep ocean</u> storing a portion of the carbon-rich biomass.

• **Ocean Fertilization** – <u>Nutrients like iron can be added</u> to the ocean to spur phytoplankton growth.

• **Artificial upwelling** – It is same as ocean fertilization, but does so by moving deeper, *nutrient-rich water to the surface*.

- **Challenges** The limited understanding of basic ocean processes is hindering progress in marine CO2 removal.
- Absorbing excess CO2 and heat is causing ocean warming, acidification, oxygen loss; changing currents and nutrient cycling; and imperilling plants and animals essential to marine ecosystems.
- They compromise the ocean's ability to provide food, support livelihoods and insulate us from the worst effects of climate change.

# References

- 1. The New Indian Express | Concerns in Marine CO2 Removal
- 2. <u>WRI Ocean based CO2 Removal</u>

# **Contributions of Birsa Munda**

A tribute was recently paid to revolutionary tribal leader Birsa Munda on his 124<sup>th</sup> death anniversary.

- He belongs to *Munda tribe*, a tribe of nomadic-hunters-turned-farmers who lived in the Chotanagpur region of Jharkhand.
- He is also known as '*Dharti ka Abba and 'Bhagwaan Birsa'*, as he achieved a Godlike status among his followers.
- Social reformer He fought *against superstition, animal sacrifice* and alcoholism.
- **Unified the tribal community** He started the *faith of "Birsait*" to challenge the British conversion activities through missionaries.
- It attracted the members of Munda and Oraon tribal communities and thereby unified the tribal community under a single umbrella.
- **Mobilized the masses** He had put examples of their ancestors and their burning patriotism to motivate the mass people.
- **Fought for Tribal land rights** His organisational skill, motivating the masses to regain freedom from the power grabbers like the Thikadars, Zamindars and money-lenders and restoration of full ownership rights as tillers of the soil.
- He demanded tribal farmers to boycott 'beth begari system' (forced labour).
- **Spearheaded tribal movement** He led the movement called 'Ulgulan', organising the Adivasis against the land settlement system imposed by the British.

# The Ulgulan Movement or The Great Tumult

• **Background** – Munda tribes follows <u>*Khuntkatti system*</u>, a joint ownership of land by tribal lineage.

• They clear forests to make the land cultivable, and the entire clan, rather than an individual, owns the land.

• **Causes of revolt** – The <u>Permanent Settlement Act (1793)</u> introduced the zamindari system and created land-owning zamindars who were seen as <u>outsiders or dikus</u> by indigenous residents.

• It allowed the dikus to claim ownership rights of tribal lands which displaced the indigenous dwellers.

• Aim of the revolt – To resist British oppression, exploitation by landlords, and the imposition of alien laws and taxes on tribal people.

• **Impact** – Though it was eventually suppressed by the British, it inspired later movements for tribal rights and land reforms.

• The government <u>repealed of the begar system</u>, and led to the <u>Tenancy Act (1903)</u> which recognised the khuntkhatti system.

• The <u>Chotanagpur Tenancy Act (1908)</u> later banned the passage of tribal land to non-tribal folks.

# Sardari Ladai (1858-90)

- An agrarian discontent against the imposition of beggars (forced labor) and illegal enhancement of rent by the intermediaries.
- Led by The "Sardars" of the Munda and Oraon tribes.
- **Approaches** Peaceful means like petition, prayers and protest to demand justice from the colonial regime.
- **Significance** It prepared the ground for Birsa Munda's rebellion.

#### References

- 1. The New Indian Express | Contribution of Birsa Munda
- 2. <u>Odisha.Gov| Birsa Munda The Great Hero of the Tribals</u>

# **Indian House Crows**

The Kenyan government has launched a campaign against Indian House Crows, aiming to eliminate one million of them by the end of 2024.

- **Taxonomy** It belongs to the family 'Corvidae'.
  - Scientific Name Corvus splendens
- Nativity Indian subcontinent.
- **Distribution** Colonized urban and suburban areas in many parts of <u>Asia, Africa, and</u> <u>the Middle East</u>.

The house crow, also known by various names such as the Indian crow, greynecked crow, Ceylon crow and Colombo crow originated from India and other parts of Asia but has since spread to many parts of the world, aided by shipping activities.

- Features They are medium-sized birds known for their adaptability and intelligence.
- They have a slightly glossy appearance.
- **Challenges in Kenya** Their *exponential rise* due to their remarkable adaptability and association with human settlements.
- Being invasive they cause *problems for tourists, farmers*, and local avian species for decades.
- It led to significant d*ecrease in the population of small indigenous birds* on the Kenyan coast by destroying their nests and preying on their eggs and chicks.

#### Reference

Down to Earth| Impacts of Indian House crows in Kenya

## COSIS

Recently, the ITLOS issued an advisory opinion on international climate change litigation requested by the COSIS.

<u>International Tribunal for the Law of the Sea (ITLOS)</u> is an independent judicial body established by the 1982 United Nations Convention on the Law of the Sea (UNCLOS).

- **COSIS** Commission of Small Island States on Climate Change and International Law, an *international commission* that have an *international legal personality*.
- Formed by The Island nations of Antigua & Barbuda and Tuvalu on the eve of COP26 at Glasgow <u>in 2021</u>.
- It entered into force upon signature by two or more states.
- **Aim** To address the unique challenges faced by small island nations regarding climate change within the framework of international law.
- **Recognition** It was <u>registered with the United Nations</u> (UN) in accordance with Article 102 of the Charter of the UN.
- Members It is open to any member of the Alliance of Small Island States (AOSIS).
  - Antigua & Barbuda, Tuvalu, Palau, Niue, Vanuatu, St. Lucia, St. Vincent & the Grenadines, and St. Kitts & Nevis.
- **Mandate** To promote and contribute rules and principles of international law *concerning climate change, protection and preservation of the marine environment* and their responsibility for injuries arising from internationally wrongful acts in respect of the breach of such obligations.
- Activities It assists Small Island States in promoting its mandate.
- It shall be authorised to request <u>advisory opinions from the ITLOS</u> on any legal question within the svope of 1982 UN Convention on the Law of the Sea (UNCLOS).
- It may appoint experts and advisors as necessary.
- **Recent advisory by ITLOS** The <u>Parties to UNCLOS have specific obligations</u> to take all necessary measures to prevent, reduce and control marine pollution from anthropogenic greenhouse gas emissions (GHG).

#### References

- 1. The Hindu| ITLOS gives advisory to COSIS
- 2. COSIS Commission of Small Island States on Climate Change and International Law

## **Pathogens in Space**

Researchers are studying multi-drug resistant pathogens on the International Space Station (ISS), which could have key applications for astronaut's health as well on Earth.

- **Organisation involved-** Indian Institute of Technology Madras (IIT Madras) and NASA's Jet Propulsion Laboratory (JPL).
- **The Jet Propulsion Laboratory (JPL)** is a <u>unique collaboration</u> between NASA and Caltech.
- Aim- To study the <u>behaviour</u>, <u>adaptation</u>, <u>and evolution of multi-drug resistant</u> <u>pathogens</u> about **400-km above** the earth's surface at the International Space Station (ISS).
- **The International Space Station (ISS)** is a large space station assembled and maintained in <u>low Earth orbit by a collaboration of five space agencies</u> and their contractors: NASA (United States), Roscosmos (Russia), JAXA (Japan), ESA (Europe), and CSA (Canada).
- **Key features of the research** Studying *genomic adaptations of drug-resistant pathogens* can improve targeted treatments.
- Insights into pathogen persistence in spaces like <u>spacecraft and hospitals can help</u> <u>manage contamination</u>.
- Integrating *genomics, metagenomics, and metabolic modeling* can study microbial dynamics in various extreme environments.
- **Comprehensive study-** To understand the *genomic, functional, and metabolic enhancements observed in multidrug-resistant pathogens* with a particular focus on Enterobacter bugandensis, a prevalent nosocomial pathogen found on surfaces within the ISS.
- Enterobacter bugandensis is a species of bacteria that belongs to the Enterobacter genus, which is commonly found in various environments including <u>soil</u>, <u>water</u>, <u>and the</u> <u>gastrointestinal tracts of humans and animals</u>.

#### Reference

**Business Standard | Pathogens in Space** 

