Carbon Footprint of Marine Fisheries Lower than Global Average

For Prelims: National Innovations in Climate Resilient Agriculture (NICRA), Emisssions from Marine fisheries

For Mains: Impacts of Increasing Carbon Footprint on marine ecosystems and initiatives to reduce it.

Why in News?

According to **Central Marine Fisheries Research Institute (CMFRI),** India's marine fisheries produced 1.32 tonnes of carbon dioxide (CO_2) to produce one kilogram of fish in 2016 during entire value chain (from the construction of boats to retail) **lower than the global average of 2 tonnes.**

What are the Key Findings of CMFRI?

- **About:**
  - The findings were discussed at a **review meeting of the fisheries component of the** National Innovations in Climate Resilient Agriculture (NICRA)**,** a research project launched in 2011.
- **Findings:**
  - **Active fishing** consumes more than **90% of the fuel used in the sector,** contributing 4,934 million kilograms of CO_2 emissions annually.
  - The country's carbon emissions from the marine mechanized fisheries sector is **16.3%, lower than the global level.**
  - While the **use of fossil fuels has increased the availability of fish to fisheries,** the dependence of the fishing sector on fossil fuels **raises concerns related to climate change.**
- **Reasons for Low Carbon Footprint:**
  - The carbon footprint from Indian marine fisheries is **smaller because they depend largely on human force.**
  - Large **mechanised fishing boats** were introduced in India in the late 1950s, but the **fleet size is growing.** Their number increased to 72,559 in 2010 from 6,708 in 1961.

What are the Impacts of Increasing Carbon Footprint on Marine Ecosystems?

- **Ocean Acidification:**
  - When carbon dioxide dissolves in seawater, it forms carbonic acid, which **lowers the pH of the water.**
  - This can make it **difficult for many marine organisms** to build and **maintain their shells and skeletons,** which can have serious consequences for their survival.
- **Changes in Marine Food Webs:**
  - Increasing carbon footprint can lead to **changes in the distribution and abundance of plankton,** which form the base of the marine food web.

    - This can affect the growth and survival of fish, marine mammals, and other species.
- **Coral Bleaching:**
    - Coral reefs are **highly sensitive to changes in water temperature** and chemistry, and increasing carbon footprint can cause widespread coral bleaching.
- **Changes in Species Diversity:**
    - Marine ecosystems are changing due to an **increase in the intensity of** cyclones**, sea-level rise and the warming of the Indian Ocean.**
    - The **diversity of species is changing.** For example, during coral bleaching, reef-associated fish deplete.

What are the Initiatives to Reduce Carbon Emissions from Fishing Sector?

- **Promotion of Green Fishing Practices:**
    - The **Pradhan Mantri Matsya Sampada Yojana (PMMSY)** scheme includes developing **Integrated Modern Coastal Fishing Villages** with an investment of Rs. 750 crores to promote sustainable fishing practices and leverage the **blue economy** for maximizing benefits to coastal fishers.
    - The government is promoting the use of renewable energy in the fishing sector, such as **solar-powered boats** and wind turbines.
- **Encouraging Alternative Livelihoods:**
    - The government is promoting alternative livelihoods for fishermen and women to reduce overfishing and pressure on marine resources.
- **Introducing Fuel Efficiency Measures:**
    - The government has introduced measures to improve fuel efficiency in fishing vessels, such as **mandating the use of high-efficiency propulsion systems and reducing idling time.**
- **Monitoring Fishing Vessels:**
    - The government has implemented a vessel monitoring system(**ReALCraft: Registration and Licensing of Fishing Craft)** to monitor fishing activities and reduce illegal fishing.
    - The system allows authorities to **track the location and movement of fishing vessels,** ensuring that they adhere to sustainable fishing practices.
- **CMFRI Initiatives:**
    - CMFRI is **developing a climate-smart value chain,** which will use science to decide where interventions are needed.
    - Further, the institute is also developing a **Coastal Climate Risk Atlas** to identify vulnerable areas in the coastal districts of India.
    - CMFRI is working at **greener fishing methods** to reduce carbon emissions. This includes **optimising fuel usage** and reducing fuel wastage.

What is Central Marine Fisheries Research Institute?

- The **CMFRI** was established by **Government of India in 1947** under the **Ministry of Agriculture and Farmers Welfare** and later it joined the **Indian Council of Agricultural Research (ICAR) in 1967.**
    - ICAR is the largest network of agricultural research and education institutes in the world functioning under the Department of Agricultural Research and Education, Ministry of Agriculture & Farmers' Welfare.

UPSC Civil Services Examination Previous Year Questions (PYQs)

Prelims

Q. Other than poaching, what are the possible reasons for the decline in the population of Ganges River Dolphins? (2014)

1. Construction of dams and barrages on rivers
2. Increase in the population of crocodiles in rivers
3. Getting trapped in fishing nets accidentally
4. Use of synthetic fertilizers and other agricultural chemicals in crop-fields in the vicinity of rivers.

Select the correct answer using the code given below:

(a) 1 and 2 only
(b) 2 and 3 only
(c) 1, 3 and 4 only
(d) 1, 2, 3 and 4

Ans: (c)

- Habitat of Ganges River Dolphins is freshwater mainly the Ganges-Brahmaputra-Meghna and Karnaphuli-Sangu River systems of Nepal, India, and Bangladesh. They are essentially blind. They hunt by emitting ultrasonic sounds, which bounces off of fish and other prey, enabling them to “see” an image in their mind.
- As per the study conducted by WWF-India, the causes of decline in population of Gangetic River Dolphins are:
    - Construction of dams and barrages on the rivers; **hence, 1 is correct.**
    - Dolphins getting trapped in fishing nets; **hence, 3 is correct.**
    - Use of synthetic fertilizers and other industrial pollutants around the vicinity of rivers. **hence, 4 is correct.**
- The increased population of crocodiles in the rivers has not been cited as a reason for the decline in population of Ganges River Dolphins. **Hence, 2 is not correct. Therefore, option (c) is the correct answer.**

Mains

Q. Defining blue revolution, explain the problems and strategies for pisciculture development in India. **(2018)**

Source:DTE