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MARINE HEATWAVES

THIS ARTICLE COVERS 'DAILY CURRENT AFFAIRS' AND THE TOPIC DETAILS OF "**Marine Heatwaves**". THIS TOPIC IS RELEVANT IN THE "**GEOGRAPHY**" SECTION OF THE UPSC CSE EXAM.

Why in the News?

Scientists from the ICAR-Central Marine Fisheries Research Institute (CMFRI) have documented an extensive bleaching phenomenon affecting the coral reefs in the Lakshadweep Sea due to marine heat waves. Surveys conducted across different Lakshadweep Islands indicate a significant portion of hard coral species experiencing severe bleaching, mainly caused by prolonged marine heatwaves impacting the area since late October 2023.

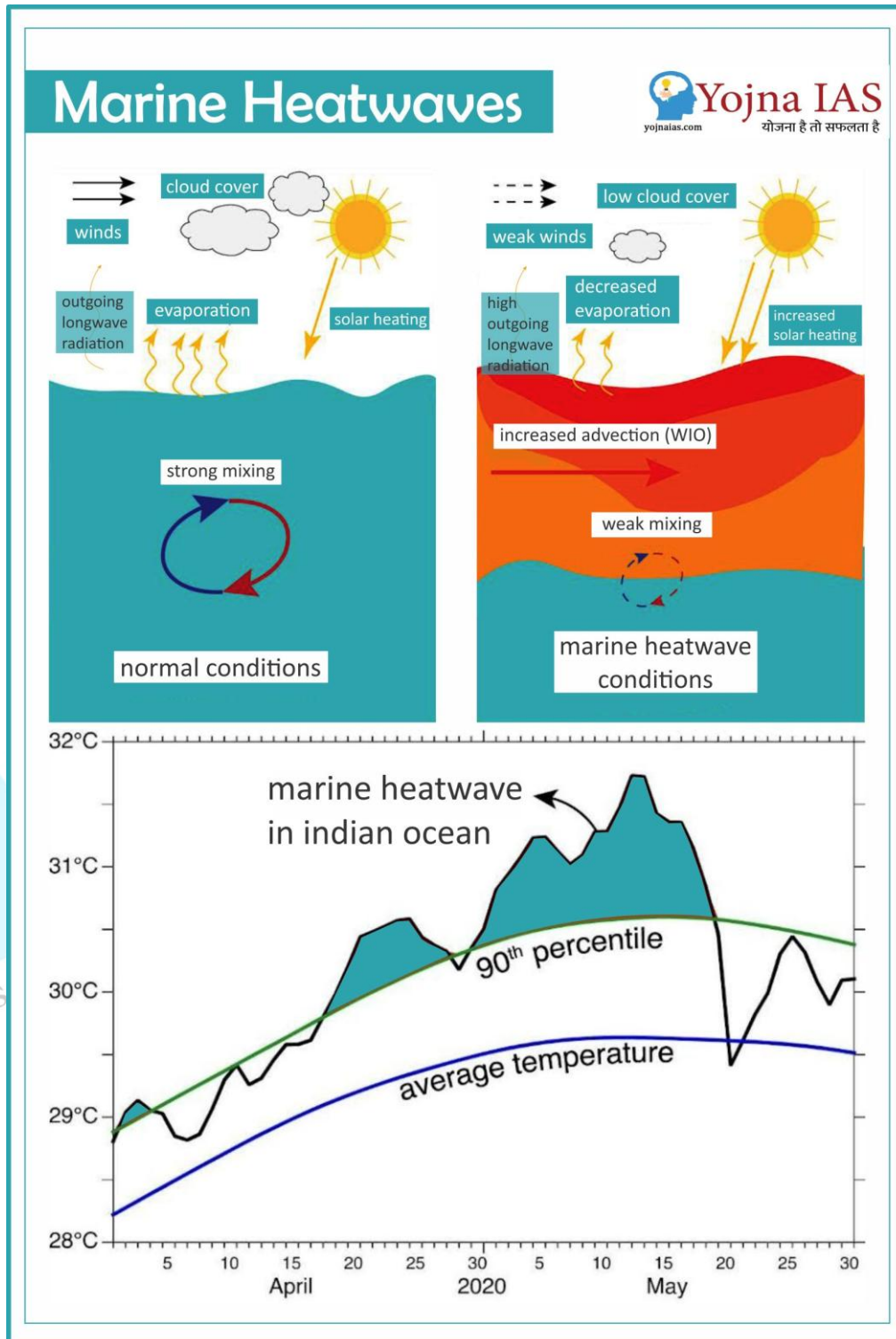
ABOUT MARINE HEATWAVES

- Marine heatwaves refer to prolonged periods of unusually warm sea surface temperatures in oceanic regions. These events can have significant ecological impacts on marine ecosystems, including coral reefs, fisheries, and marine life.
- It happens when the surface temperature of a specific area of the ocean **increases by 3 or 4 degrees Celsius above the usual temperature for a minimum of five consecutive days.**

WHY ARE MARINE HEATWAVE INCIDENTS ON THE RISE IN THE INDIAN OCEAN?

- The Indian Ocean has experienced a rapid increase in temperature, rising by 1.2°C per century from 1950 to 2020, with projections indicating even swifter **warming at a rate of 1.7-3.8°C per century from 2020 to 2100.** This heightened warming has resulted in a notable surge in marine heat waves across the region.
- Various climate phenomena, such as **strong El Niño events and positive phases of the Indian Ocean Dipole (IOD)** have played a role in initiating and amplifying marine heatwaves in the Indian Ocean. These climate modes can disrupt ocean-atmosphere interactions, leading to unusually high ocean temperatures.
- The broader context of climate change, marked by escalating greenhouse gas emissions and global warming, has exacerbated the frequency, severity, and duration of marine heat waves globally, including in the Indian Ocean. Projections from climate models suggest that without significant emission reductions, the Indian Ocean could experience prolonged marine heatwave conditions by the century's end.

- Following a marine heatwave in May 2020, an underwater investigation revealed that **85% of the coral reefs in the Gulf of Mannar near the Tamil Nadu coast experienced bleaching.**



ADVERSE IMPACT OF MARINE HEATWAVES

- **Coral Bleaching:** One of the most immediate and severe consequences is coral bleaching, where corals expel the algae living in their tissues, leading to loss of color and vital nutrients. This phenomenon weakens the corals and makes them more susceptible to disease, ultimately resulting in widespread coral mortality and degradation of coral reef ecosystems.
- **Distribution of Marine Species:** Marine heatwaves can disrupt the distribution and abundance of marine species, leading to shifts in species composition and ecosystem dynamics. Some species may thrive in warmer conditions, while others may struggle to survive or migrate to cooler waters, causing disruptions in food webs and biodiversity.
- **Harmful Impact on Marine Ecosystem:** Marine heatwaves can trigger harmful algal blooms (HABs), which produce toxins that can harm marine life and pose risks to human health through the consumption of contaminated seafood. These blooms can lead to mass mortalities of fish, shellfish, and other marine organisms, as well as economic losses for fisheries and coastal communities.
- **Economic Impact:** Marine heatwaves can lead to economic setbacks due to their repercussions on fisheries and aquaculture. For instance, the abalone harvest in Northern Western Australia suffered damage during a marine heatwave in 2011, resulting in financial losses.
- **Marine food chain:** Marine heatwaves exert a significant influence on the oceanic food chain by disrupting its foundation, impacting ecosystems, and potentially affecting global food resources. Studies suggest that these heat waves modify microorganisms, notably phytoplankton, which play a vital role at the bottom of the marine food chain.

ABOUT CORAL BLEACHING

- Coral bleaching is a phenomenon in which coral reefs lose their vibrant colors and turn white due to the expulsion of symbiotic algae called zooxanthellae from their tissues. These algae provide corals with essential nutrients through photosynthesis and contribute to their coloration.
- Factors such as increased water temperatures, pollution, and environmental stress can cause corals to expel these algae, leaving them bleached and vulnerable to disease and death.
- Coral bleaching is a sign of coral stress and can result in widespread damage to coral reef ecosystems, disrupting marine biodiversity and impacting coastal communities that rely on reefs for food, tourism, and coastal protection.

WHY IS CORAL BLEACHING IN LAKSHADWEEP?

- **Temperature Increase:** The **Degree Heating Week (DHW)** in Lakshadweep has surpassed a critical threshold, with the Lakshadweep Sea consistently experiencing temperatures one degree Celsius above the average since October 27, 2023. Apart from elevated atmospheric temperatures due to global warming, changes in ocean currents also contribute to unusually high water temperatures.
- **Marine Heat Waves:** Lakshadweep has been experiencing marine heatwaves since October 2023. If the water temperatures do not decrease, the coral bleaching could lead to the demise of Lakshadweep's coral reefs. **While coral bleaching events have occurred in the Lakshadweep Sea in 1998, 2010, and 2015, the current event's scale is unprecedented.**

About Degree Heating Week (DHW)

- Degree Heating Week (DHW) is a metric employed to assess the cumulative heat stress experienced in a particular region over the preceding 12 weeks. It involves aggregating all instances where the temperature surpasses the threshold for coral bleaching within this timeframe.

MEASURES TO TACKLE THE PROBLEM OF MARINE HEATWAVES

- **Sustainable Fisheries Management:** Implementing sustainable fishing practices to reduce stress on marine ecosystems and prevent overexploitation of fish stocks. This includes establishing marine protected areas and implementing quotas and regulations to ensure the long-term health of fisheries.
- **Coastal Adaptation and Resilience:** Investing in coastal infrastructure and habitat restoration projects to enhance the resilience of coastal communities to the impacts of marine heatwaves and sea-level rise. This can include building seawalls, restoring mangrove forests, and implementing green infrastructure solutions to mitigate flooding and erosion.
- **Climate Change Mitigation:** Taking action to reduce greenhouse gas emissions and mitigate the drivers of climate change, such as transitioning to renewable energy sources and implementing energy efficiency measures.
- **Fostering Stakeholder Participation and Resilience:** Raising awareness among policymakers, researchers, industries, and local communities is essential for building resilience to marine heat waves. Coordinated responses and collaborative efforts can facilitate the implementation of measures to protect coastal communities and ecosystems. Additionally, diversifying livelihoods and adapting economic activities can help mitigate the adverse impacts of heat waves.
- **Advance Early Warning Systems:** Implementing monitoring programs to track sea surface temperatures and detect the onset of marine heatwaves. Early warning systems can alert coastal communities and resource managers to take proactive measures in response to rising sea temperatures.

PRELIMS BASED QUESTION

Q1. Consider the following statements regarding Corals:

1. Corals survive well in pollution-free and clear water.
2. Corals can withstand high-temperature ranges.

Choose the correct answer using the codes given below:

- (a). 1 Only
- (b). 2 Only
- (c). Both 1 and 2
- (d). Neither 1 nor 2

ANSWER: A

MAINS BASED QUESTION

Q1. Discuss the factors contributing to the rise of marine heatwaves in the Indian Ocean and their implications on marine ecosystems. How can these heatwaves be effectively monitored and managed to mitigate their impacts?

GST APPELLATE TRIBUNAL

THIS ARTICLE COVERS 'DAILY CURRENT AFFAIRS' AND THE TOPIC DETAILS OF "GST Appellate Tribunal". THIS TOPIC IS RELEVANT IN THE "Economy" SECTION OF THE UPSC CSE EXAM.

WHY IN THE NEWS?

Union Minister for Finance and Corporate Affairs Smt. Nirmala Sitharaman administered the oath of integrity and secrecy to Justice (Retd.) Sanjaya Kumar Mishra is the President of the GST Appellate Tribunal (GSTAT). Mr Mishra was a former Chief Justice of the Jharkhand High Court and was selected by a Search-cum-Selection Committee headed by the Chief Justice of India.



WHAT IS THE GOODS AND SERVICES TAX APPELLATE TRIBUNAL?

The GSTAT is the quasi-judicial body established under Section 109 of the Central Goods and Services Tax Act, 2017, to hear various appeals under the said Act and the respective State/Union Territories GST Acts against the orders of the first appellate authority. It represents a specialised authority formed to resolve GST-related disputes at the appellate level.

As per the approval of the GST Council, the government has notified the Principal Bench, which is to be located in New Delhi, and 31 State Benches at various locations across the country.

The tribunal composition includes a head known as the President, a Judicial Member, and two Technical Members, one representing the state and the other from the central Government. **The eligibility criteria of the members are:**

- The tribunal president must be a Supreme Court judge or have served the High Court as the Chief Justice.
- The Judicial member must have served as a High Court or an Additional/District Judge for 10 years.
- The Technical Member (Centre) should be a Group A Indian Revenue Service or All India Service member with three years of GST administration experience in the Central Government and must have 25 years of service in Group A.
- The Technical Member (State) should be a state officer or All India Service officer above the Additional Commissioner of VAT and First Appellate Authority rank, with at least 25 years in Group A or equivalent services and three years in GST, finance, or taxation administration.

The president and members of GSTAT serve for four years or until they reach 70 (president) or 67 years of age. GSTAT is equivalent to a Civil Court for trying a case. It can pass orders, hear cases, impose penalties, and revoke or cancel registrations.

Some of the key functions of the tribunal include:

1. **Hearing Appeals:** GSTAT primarily hears appeals against decisions made by the lower authorities under the GST law. This includes appeals against orders issued by the Appellate Authority for Advance Ruling (AAAR) and decisions made by the Revisional Authority.
2. **Dispute Resolution:** One of GSTAT's primary functions is to provide an independent and efficient mechanism for resolving disputes related to GST. Taxpayers can approach the tribunal to challenge decisions they believe are incorrect or unjust.
3. **Interpretation of Law:** It plays a crucial role in interpreting various provisions of the GST law. Its decisions help clarify legal issues and establish precedents that guide taxpayers and tax authorities in compliance with GST regulations.
4. **Appellate Authority:** It acts as the final appellate authority in GST matters, providing a platform for taxpayers to seek redressal beyond the initial stages of adjudication. Its decisions are binding on taxpayers and tax authorities, subject to any further appeal to higher courts.
5. **Speedy Disposal:** The tribunal is tasked with ensuring the speedy disposal of appeals, thereby reducing the backlog of cases and providing timely resolution to taxpayers. This helps in maintaining the efficiency and effectiveness of the GST system.
6. **Technical Expertise:** GSTAT comprises judicial and technical members, ensuring it has the expertise to adjudicate complex GST matters. The technical members often possess specialised knowledge in accounting, taxation, and commerce, enabling them to make informed decisions.

GSTAT's proceedings and decisions will soon be transparent and publicly available. This transparency will foster trust in the tax administration system and allow stakeholders to understand the rationale behind tribunal rulings. GSTAT's rulings establish legal precedents that guide future interpretations of GST laws. These precedents will help taxpayers and tax authorities anticipate how similar cases may be decided, thereby promoting consistency and predictability in tax compliance.

ABOUT THE GOODS AND SERVICES TAX ACT, 2017:

- The Goods and Services Tax Act, 2017 (GST Act) is a comprehensive legislation enacted by the Government of India to overhaul the country's indirect tax system. It came into effect on July 1, 2017.
- The GST Act introduces a unified tax structure to create a single, nationwide market by subsuming various indirect taxes levied by the central and state governments. Under the GST Act, the central and state governments have the authority to levy and collect GST on the supply of goods and services. This dual GST model consists of Central Goods and Services Tax (CGST) levied by the central government and State Goods and Services Tax (SGST) levied by the state governments.
- GST operates on the destination-based consumption taxation model, differing from the current origin-based tax system. The rates for CGST, SGST, and IGST are determined through mutual agreement between the Central and State governments based on recommendations from the GST Council. Initially, GST was levied at four rates: 5%, 12%, 16%, and 28%. The GST Council has worked out the schedule or list of items that would fall under these multiple slabs.

- Article 279A establishes the GST Council, chaired by the Union Finance Minister and including state-nominated ministers. The central government holds 1/3 of the voting power, while states hold 2/3. Decisions require a 3/4 majority.

PRELIMS PRACTICE QUESTION:

Q. WITH REFERENCE TO THE GST APPELLATE TRIBUNAL, CONSIDER THE FOLLOWING STATEMENTS:

1. The GST Appellate Tribunal is a quasi-judicial body to resolve disputes related to GST laws at the appellate level.
2. The president of the Tribunal must be a Supreme Court judge or have served as the chief justice of the High Court.
3. The tribunal is equivalent to a Civil Court for trying a case.

How many of the above statement/s is/are correct?

- A. Only one
- B. Only two
- C. All three
- D. None

ANSWER: C

MAINS PRACTICE QUESTION:

Q. What is the importance of the GST Appellate Tribunal in the context of tax dispute resolution in India? How does the GST Appellate Tribunal ensure impartiality and fairness in its decision-making process?

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