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Warming of Indian Ocean

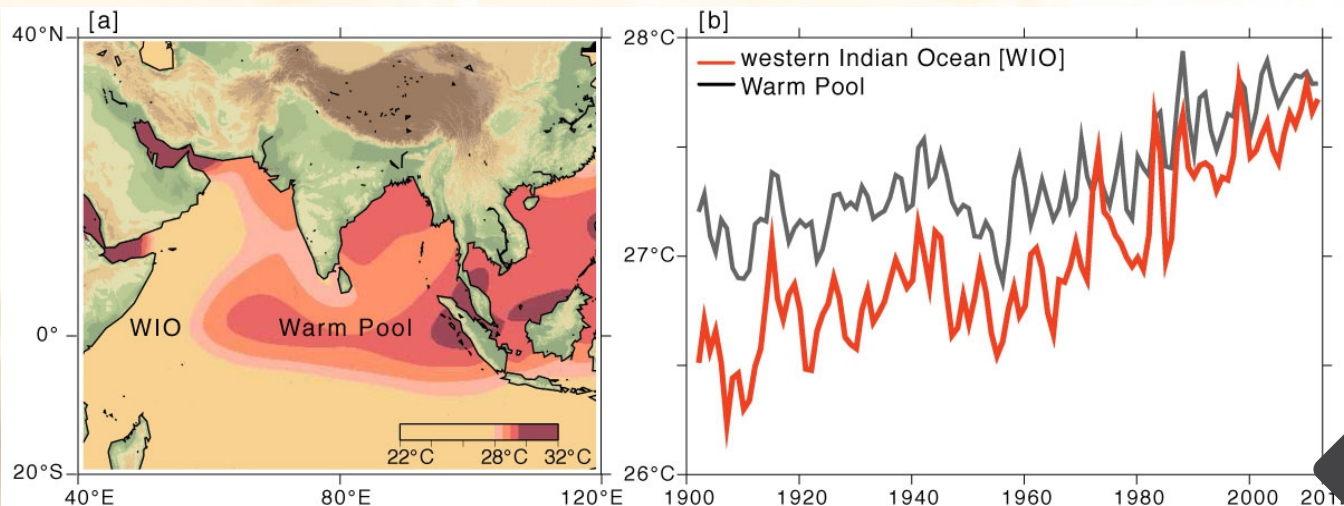
Why in News?

- A new study published in journal Science Direct has predicted that between 2020 and 2100, the Indian Ocean could warm at a rate of 1.7-3.8 degrees Celsius per century.

More About the News

- The Indian Ocean is experiencing unprecedented and accelerated warming, which may continue throughout the century unless greenhouse gases (GHGs) are reduced immediately.
- This warming of the ocean’s surface, along with the heat accumulated in the first 2,000 metres below the surface, has significant repercussions for the southwest monsoon season, which provides about 70 per cent of India’s annual rainfall and also affects rainfall patterns in other South Asian countries.
- Currently, the heat content of the first 2,000 metres below the ocean surface is increasing at a rate of 4.5 zettajoules per decade, with projections indicating a dramatic increase to 16-22 zettajoules per decade in the future, according to the study.

- This warming could also lead to more frequent and intense extreme weather events, such as tropical cyclones and floods, as well as a rise in sea levels due to thermal expansion.
- The study also examined the Indian Ocean’s warming over the past century, finding that the ocean basin heated at a rate of 1.2°C per century between 1950 and 2020.
- The northwestern parts of the Indian Ocean, including the Arabian Sea, experienced the most significant warming, while the southeastern parts of the ocean, off the coasts of Sumatra and Java, experienced the least warming.
- The study also discovered that the seasonal cycle of surface temperatures has shifted and might shift further due to warming. Between 1980 and 2020, the maximum sea surface temperatures (SST) across the Indian Ocean generally stayed below 28°C (ranging from 26-28°C).
- If GHGs are emitted at current levels, the minimum SSTs in the Indian Ocean could exceed 28°C (28.5-30.7°C) all year round by the end of the 21st century, according to the study. Generally, SSTs above 28°C are



conducive to the formation of tropical cyclones and extremely heavy rainfall.

- Other natural climatic phenomena, such as the Indian Ocean Dipole (IOD), are also expected to change due to the warming of the Indian Ocean.
- The positive and negative phases of the IOD influence rainfall during the southwest monsoon and affect the formation of tropical cyclones.
- In the positive phase of the IOD, when the western parts of the Indian Ocean are warmer than the eastern parts, monsoon rainfall generally increases across many regions in India and the rest of South Asia.
- In the negative phase, when the western parts of the ocean are cooler than the eastern parts, less than normal rainfall is observed during the post-monsoon period in northwestern India.
- The study recommended a multifaceted approach to address the imminent challenges in the Indian Ocean. Reducing GHG emissions and building climate-resilient infrastructure are the most effective strategies to mitigate the current and future impacts of warming.

International Labour Day

Why in the News?

- Every year on May 1, International Labour Day is observed to remember the struggles and sacrifices of the workers and labour movements. The day is also referred to as May Day or International Workers' Day.



More About the News

- International Labour Day is aimed at emphasising the value of labourers and their role in constructing society.
- On this day, people all over the world march to advocate working-class rights and protect them from exploitation.
- International Labour Day helps us to recognise the contributions of the labours and the working class in development of the society and the country.
- It also urges the labours to learn about their rights. Labours are often exploited, and it is important that they know their rights to protect themselves.
- It also urges people to come together to develop the working and living conditions of the workers.
- In 1886, a large demonstration happened in America where the labours demanded eight hours of work on a daily basis. However, soon the demonstration went out of hand and in Chicago and lot of people got hurt.
- This incident came to be known as The Haymarket Affair. This incident marked the start of the International Labour Day.
- In 1889, a lot of socialist parties in Europe came together and decided to celebrate May 1 as International Labour Day. Since then, the special day has been observed every year on the same day.

Glacial Lake Outburst Floods (GLOFs)

Why in the News?

- Recently, an unexpected outburst from Birendra Lake, nestled within the Manaslu Glacier in Gorkha District, has led to a flash flood downstream.

More About the News

- A GLOF is a flood resulting from the sudden and rapid release of water from a glacial lake, often caused by the failure of a moraine dam or ice dam.
- The primary trigger for a GLOF is the collapse or breach of a moraine dam or ice dam holding back water in a glacial lake.



This can be caused by factors such as glacial melt water, avalanches, or volcanic activity.

- Glacial lakes are typically formed by the accumulation of melt water from glaciers. The lake is held back by moraine (accumulation of glacial debris) or ice dams.
- It is commonly associated with glacial regions, especially in mountainous areas with significant glacial activity. Examples include the Himalayas, Andes, and Alps.
- Climate change-induced glacial melt, seismic activity, and changes in glacial morphology are key risk factors for GLOFs.
- GLOFs can result in devastating downstream flooding, destruction of infrastructure, and loss of life.
- In the Hindu Kush Himalaya, moraine-dammed glacial lakes are common and numerous GLOF events have been traced back to the failure of moraine dams.
- The frequency of GLOFs and risk from potential GLOFs are expected to increase as the climate continues to change. As temperatures rise, new lakes form, existing ones expand and sometimes merge, increasing the potential flood volumes in the high mountains.

Hangor Class Submarines

Why in the News?

- China has launched the 1st of the eight Hangor-class submarines for its all-weather ally Pakistan to provide it with state-of-the-art warships.

More About the News

- The Hangor-class, an export variant of the Chinese Type 039A Yuan class, is a diesel-



electric attack submarine, named after the now decommissioned PNS Hangor, which famously sank Indian frigate INS Khukri during the 1971 war.

- The Hangor-class boasts four diesel engines. It is also equipped with an air independent propulsion (AIP) system, which significantly increases the submarines' endurance underwater.
- The Hangor-class has six 21 inch torpedo tubes, and capabilities to launch anti-ship missiles, as well as the Babur-3 subsonic cruise missile, which has a range of 450 km.
- Pakistan's Hangor class is the direct counterpart of India's Kalavari class of submarines, based on the French Scorpene-class.
- In terms of size, the Hangor class is significantly bigger than the Kalavari class, which displaces 1,775 tons and is 67.5m long.
- In terms of armament, the Kalavari class carries six 21 inch, German-made torpedoes, and missile systems such as French Exocet anti-ship missiles, and MICA anti-air missiles. This is likely superior, and more battle tested than Hangor's armament.
- Both submarines do not have vertical launch systems (like the ones in India's nuclear Arihant class), which would allow it to carry bigger cruise missiles like the Brahmos-NG.

Kankesanthurai Port

Why in the News?

- Sri Lanka's Cabinet has approved the plan to renovate the Kankesanthurai port in the

Northern part of the island. The project will be executed under an Indian financial grant.

More About the News

- The decision not only addresses the port's infrastructural needs but also underscores the strength of bilateral cooperation between Sri Lanka and India.
- Situated in the northern region of Sri Lanka, the 16-acre Kankesanthurai Port or KKS Port, is located 104 km from Karaikal Port in Pondicherry, India.
- Last year, ferry services between India and Sri Lanka commenced with a direct passenger ship service connecting Nagapattinam in Tamil Nadu to Kankesanthurai port in Sri Lanka.
- With Sri Lankan Cabinet approving the plan to renovate the Kankesanthurai port in northern part of the island, connectivity between the two countries is likely to improve further.

- Indian government had recently decided to fully fund the Kankesanthurai Port development project as it had faced considerable delays already.
- India and Sri Lanka have been actively implementing the joint vision document under which connectivity is an important facet.



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