



20 April, 2024

### Fourth global mass coral bleaching

**Context:** The US National Oceanic and Atmospheric Administration (NOAA) reported that extraordinary ocean temperatures have triggered the fourth global mass coral bleaching event.

#### ➤ Trigger of the Global Coral Bleaching Event:

- Since mid-March 2023, unusually high sea surface temperatures (SST) have been observed.
- In March of the same year, SST reached a record monthly high of 21.07 degrees Celsius.
- Rising emissions of heat-trapping greenhouse gases (GHGs), such as carbon dioxide and methane, are the primary cause.
- Approximately 90% of the additional heat trapped by GHGs has been absorbed by the oceans, leading to warmer ocean temperatures.

#### ➤ Understanding Corals and Coral Reefs:

- Corals are sessile animals that permanently attach to the ocean floor and form colonies.
- They can be classified as hard corals, which build coral reefs, and soft corals.
- Coral reefs, also known as "rainforests of the sea," have existed for nearly 450 million years and support a diverse marine ecosystem.
- The Great Barrier Reef in Australia, spanning 2,028 kilometers, is the largest coral reef system globally.

#### ➤ Significance of Corals:

- Coral reefs play a crucial role in marine ecosystems, hosting thousands of marine species.
- They provide economic benefits worth about \$375 billion annually and support over 500 million people worldwide for food, income, and coastal protection.
- Coral reefs absorb up to 97% of energy from waves, storms, and floods, preventing loss of life and property damage.

#### ➤ Understanding Coral Bleaching:

- Corals contain algae called zooxanthellae, forming a symbiotic relationship.
- Stressors like increased temperatures can cause corals to expel zooxanthellae, resulting in coral bleaching.
- Bleached corals are more susceptible to mortality and diseases, impacting marine biodiversity.

#### ➤ Global Coral Bleaching Events:

- Global mass bleaching events, affecting coral reefs worldwide, are relatively new phenomena.
- Previous events occurred in 1998, 2010, and between 2014 and 2017, affecting significant portions of reef areas.

#### ➤ Current Status and Impact:

- NOAA has confirmed the ongoing fourth global bleaching event, affecting coral reefs in over 54 countries.

- The Great Barrier Reef is experiencing severe bleaching, with approximately one-third of surveyed reefs showing extreme bleaching.
- The event's impact is expected to be severe, potentially leading to the loss of a vast majority of coral reefs if global warming continues unabated.

#### ➤ Future Outlook and Mitigation Efforts:

- With global temperatures rising, such bleaching events are expected to become more frequent and prolonged.
- To mitigate coral bleaching and preserve coral reefs, efforts to reduce greenhouse gas emissions and limit global warming are crucial.
- Achieving net-zero emissions by 2050, as outlined in the Paris Agreement, is necessary to prevent further deterioration of coral reefs.



### Global Alliance for Incinerator Alternatives (GAIA)

**Context:** GAIA and allies ask ASEAN to tackle plastic pollution swiftly, stressing urgent action needed to address environmental crisis.

#### ➤ About GAIA:

- GAIA is a worldwide alliance comprising more than 1,000 grassroots groups, non-governmental organisations, and individuals operating in over 90 countries.
- The organisation focuses on catalysing a global shift towards environmental justice by strengthening grassroots social movements dedicated to addressing waste and pollution.

#### ➤ Mission and Approach:

- GAIA aims to facilitate a transition away from the current linear and extractive economy towards a circular system that upholds people's right to a safe and healthy environment.

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- To achieve this goal, GAIA employs various strategies, including conducting local campaigns, advocating for policy changes, conducting research and communication initiatives, and building grassroots movements.

### ➤ Intervention Points:

- GAIA focuses its efforts on four primary areas: incineration, zero waste, plastic, and climate.
- The organisation works towards mainstreaming zero waste systems in cities and municipalities and advocates for policies that reduce the production and consumption of single-use plastics worldwide.

### ➤ Zero Waste Advocacy:

- GAIA supports cities and municipalities in implementing successful zero waste plans and programs.
- The organisation also advocates for policies aimed at reducing the production and consumption of single-use plastics on a global scale.
- Additionally, GAIA assists grassroots campaigns in shutting down existing incinerators, preventing the development of new waste technologies, and supporting frontline communities affected by waste and pollution.

### ➤ Climate Action:

- GAIA collaborates with community leaders to implement waste and climate action plans in cities worldwide.
- The organisation aims to demonstrate the positive climate impacts of zero waste solutions and advocates for policy changes that prioritise climate justice from the bottom up.

## BrahMos

**Context:** India delivered BrahMos missiles to the Philippines as part of a \$375 million deal signed in 2022.

### ➤ Overview of BrahMos Missile:

- BrahMos is a long-range supersonic cruise missile system capable of being deployed from land, sea, or air.
- Developed by BrahMos Aerospace, it is one of the world's fastest cruise missiles, capable of reaching speeds of up to Mach 3.
- Named after the rivers Brahmaputra and Moskva (Russia), it was first tested in 2001 and has since been inducted into the Armed Forces.

### ➤ Working of BrahMos Missile:

- BrahMos is a cruise missile designed to deliver ordnance or payloads to targets.

- It can be launched from various platforms, including ground, air, sea, and submarine.
- Propulsion primarily relies on jet engines, enabling it to fly at various altitudes within the atmosphere.

### ➤ Formation of BrahMos Aerospace:

- BrahMos Aerospace was formed as a joint venture between India's DRDO and Russia's NPOM following a 1998 intergovernmental agreement.
- The objective was to design, develop, manufacture, and market the world's first supersonic cruise missile system, BrahMos.
- The partnership allocated ownership with India holding 50.5% and Russia 49.5%.

### ➤ BrahMos Missile Series:

- BrahMos has undergone several upgrades since its inception, with versions tested for land, air, and sea platforms.
- It features advanced technologies such as stealth, guidance systems, and "Fire and Forget" operation.

### ➤ BrahMos-NG (Next Generation):

- BrahMos-NG is a multi-platform, multi-target, and lightweight weapon system with enhanced stealth capabilities.
- Designed for ground-based, aerial, surface, and underwater deployment, it boasts increased versatility and reduced radar cross-section.

### ➤ BrahMos-II (Mark II):

- BrahMos-II is a hypersonic cruise missile intended for ship-based deployment.
- Inspired by Russia's 3M22 Tsirkon, it is expected to achieve speeds of up to Mach 7 and ranges exceeding 300 miles.

### ➤ Versions of BrahMos:

- BrahMos is deployed across land, sea, and air platforms, with ongoing upgrades focused on range, manoeuvrability, and accuracy.
- It includes land-based complexes, ship-based systems, air-launched variants, and submarine-launched versions.

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## NEWS IN BETWEEN THE LINES

### Electric Air Taxi



Recently, Archer Aviation, backed by Stellantis and Boeing revealed plans to initiate trials of their electric air taxi in India next year, aiming for a commercial launch by 2026.

#### About Electric Air Taxi:

- Electric air taxis **represent an innovative mode of transportation** aimed at addressing urban congestion and providing **efficient, time-saving** travel options in densely populated cities.
- They are **powered by electric propulsion systems**, making them environmentally friendly alternatives to traditional fossil fuel-powered aircraft.
- They contribute to **reducing carbon emissions** and **mitigating the impact of air pollution**.
- They leverage **cutting-edge technology** in electric propulsion, **battery storage** and autonomous flight systems to enable safe, quiet and efficient aerial transportation within urban areas.
- Electric air taxi operations **require integration with existing urban infrastructure**, including **helipads and vertiports**, to facilitate take-off, landing and passenger boarding in urban areas.
- Several companies, including **startups** and **established aerospace manufacturers**, are investing in the development of electric air taxi technology.

### DURGA-2



Recently, DRDO has initiated testing of a prototype for its DURGA-2 (Directionally Unrestricted Ray Gun Array) system.

#### About DURGA-2:

- DURGA-2 is a **laser weapon developed** by the Defence Research and Development Organisation (DRDO) of India.
- It is a **100-kilowatt directed-energy weapon (DEW)** that can be used on land, naval and air.
- It can **neutralize drone attacks, deflect ballistic missiles** and **destroy fighter jets** at the speed of light.
- It **uses lasers, microwaves or particle beams** to damage or destroy targets using focused energy.
- This system offers advantages over conventional munitions, transmitting lethal force at the speed of light and remaining unaffected by gravity or atmospheric drag.

### Vasuki indicus



Recently, Paleontologists in India unearthed fossilized remains of Vasuki indicus in Gujarat's Panandhro Lignite Mine, Kutch.

#### About Vasuki indicus:

- Vasuki indicus is an **ancient giant snake** discovered in India, estimated to measure between **36 to 50 feet (11 to 15 meters)** in length.
- Named after the **mythical snake king associated with Hindu deity Shiva**, Vasuki lived approximately 47 million years ago in the marshy evergreen woods of **western India**.
- It was a **slow-moving ambush predator**, likely subduing prey through constriction.
- It is an **extinct species of giant snake** discovered in India, estimated to be one of the largest snakes ever known to have existed.
- Vasuki shares **similarities with Titanoboa**, another enormous snake found in Colombia, both living during periods of unusually warm temperatures.
- Fossils of Madtsoiidae snakes, including Vasuki indicus, have been previously found in India, with late **Oligocene specimens discovered in Ladakh Himalaya in 2022**.

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## Shompen Tribe



Recently, Shompen tribe from Great Nicobar Island's rainforests, voted for the first time in the Andaman and Nicobar Lok Sabha constituency, a historic democratic milestone.

### About the Shompen Tribe:

- The Shompen tribe is classified as a **Particularly Vulnerable Tribal Group (PVTG)** by the Government of India, signifying their vulnerable socio-economic status and cultural distinctiveness.
- They primarily resides in the dense tropical rainforests of **Great Nicobar Island**, which is part of the Andaman and Nicobar Islands territory.
- They are **nomadic hunter-gatherers** who live in small groups.
- They hunt wild **game, forage** for fruits and **forest foods**, and farm **yams, roots**, vegetables and **tobacco**.
- Historically, the Shompen tribe has maintained a **secluded and isolated lifestyle**, with limited contact with the outside world.
- According to the **2011 Census data**, the estimated population of the **Shompen tribe was 229 individuals**.

## POINTS TO PONDER

- What was the focus of 'World Heritage Day 2024'? – **Discover and Experience Diversity**
- Which city in Uttar Pradesh is the origin of the recently GI-tagged Tiranga Barfi? – **Varanasi**
- Where was the inauguration of the advanced Submersible Platform for Acoustic Characterization and Evaluation (SPACE) conducted?  
– **Kerala**
- In what habitat is the Leaf Litter Frog predominantly located? – **Brazilian Atlantic Rainforest**
- What geographical feature is 'Salas y Gomez', recently highlighted in the news? – **Oceanic ridge in the Southeastern Pacific Ocean**

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