

Prelim Bits 07-06-2023 | UPSC Daily Current Affairs

Vibrio Bacteria in Seaweed

Clusters of brown Sargassum seaweed reported to be infested by Vibrio bacteria, a flesh-eating bacterium, were found awash in Florida.

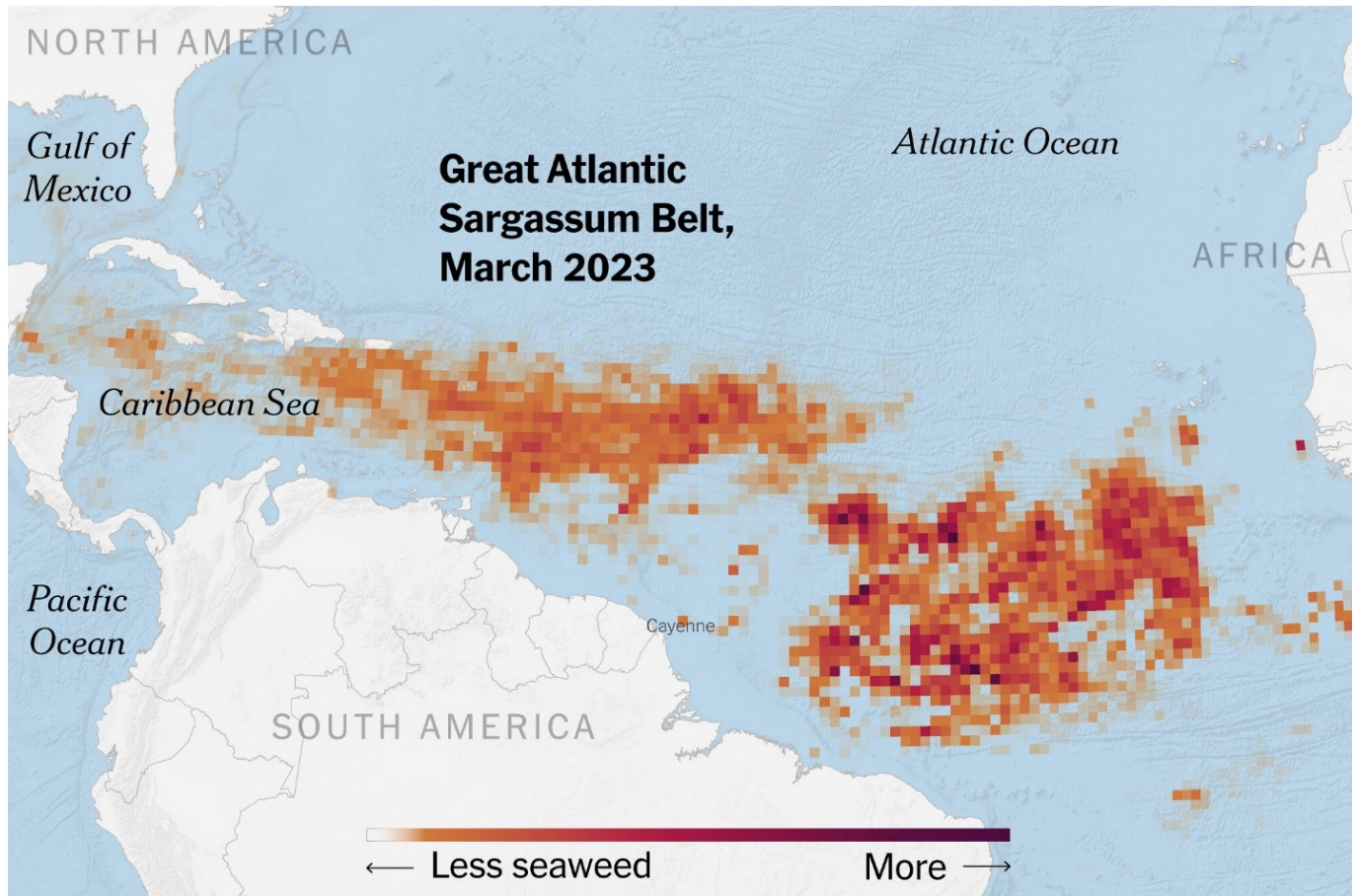
- **Pathogen storm** - A new study revealed that the Great Atlantic Sargassum Belt could become overrun with species of Vibrio bacteria.
- This bacteria can cling to the surface of plastic waste which gets entwined in the large mass of seaweed and poses significant health risks.
- This study says that this could create a perfect pathogen storm.



Sargassum is a genus of large brown seaweed (a type of algae) that floats in island-like masses and never attaches to the seafloor.

Great Atlantic Sargassum Belt

- It is a 5,000 mile-wide thicket of seaweed.
- This floating habitat provides food and protection for fishes, mammals, marine birds, crabs, and more.
- When the Sargassum piling up on beaches and decomposes it releases hydrogen sulfide, a toxic gas.



Vibrio Bacteria

- Vibrios are aquatic microorganisms.
- Some species of which cause serious diseases in humans and other animals.
- Vibrios are microbiologically characterized as gram-negative, highly motile, facultative anaerobes (not requiring oxygen).
- People can get infected by Vibrio by eating raw or uncooked seafood.
- Contact with an open wound could cause necrotizing fasciitis, the flesh-eating bacteria infection.
- The infection can lead to amputation or death.
- **Amplification** - Scientists discovered a set of genes called 'zot' genes, which causes leaky gut syndrome.
- If a fish eats a piece of plastic and gets infected by this Vibrio, which then results in a leaky gut and diarrhea.
- It's going to release waste nutrients such nitrogen and phosphate that could stimulate Sargassum growth and other surrounding organisms.

Reference

[Hindustan Times | Flesh-eating bacteria in seaweed on Florida beaches](#)

Kakhovka Dam

Kakhovka dam in southern Ukraine was collapsed recently, causing extensive flooding.

- The dam is built on Ukraine's Dnipro River.
- **Dnipro River** - It separates Ukraine into two parts — east and west.
- It flows north to south connecting the capital, Kiev, to the Black Sea.
- It was built in 1956 as part of the Kakhovka hydroelectric power plant.
- The reservoir it contains holds water of about the same volume as the Great Salt Lake in Utah.
- Bursting the dam could send a wall of water flooding settlements below it, including Kherson.
- Water from the reservoir supplies the Crimean peninsula to the south, which was annexed by Russia in 2014, as well as the Zaporizhzhia nuclear plant, Europe's largest, to the north.
- It also helps power the Kakhovka hydroelectric plant.

Kakhovka dam and reservoir



- | | |
|--|---|
| Russian military control | Limited Russian military control |
| Held or regained by Ukraine since 12 May 2023 | Russia annexed Crimea in 2014 |

Zaporizhzhia Nuclear Power Plant

- It is situated in the Southeastern Ukraine and is the largest nuclear power plant in

Europe.

- The nuclear power plant has 6 nuclear reactors and one of the 4 operating nuclear power plants in the country.
- It generates up to 42 billion kWh of electricity, accounting for about 40% of the total electricity generated by all the Ukrainian NPPs and 1/5th of Ukraine's annual electricity production.
- Ukrainian and UN experts said that the kakhovka dam collapse does not pose an immediate threat to the Zaporizhzhia Nuclear Power Plant (NPP) but will have long-term implications for its future.

Reference

[Indian Express | Kakhovka-dam-ukraine-russia-war](#)

The Energy Progress Report 2023

The World is still off-track from achieving universal energy access (SDG 7) to all, says UN report.

- Since 2018, the report envisages to track the Sustainable Development Goal-7 (SDG7).
- **Aim** - It aims to ensure access to affordable, reliable, sustainable, and modern energy for all.
- It is produced annually by 5 of the custodian agencies responsible for tracking global progress toward Sustainable Development Goal 7 (SDG7).
- **Custodian Agencies** -
 - The International Energy Agency (IEA),
 - The International Renewable Energy Agency (IRENA),
 - The United Nations Statistics Division (UNSD),
 - The World Bank, and
 - The World Health Organization (WHO)

Highlights of the report

- Despite some progress across the indicators, the current pace is not adequate to achieve any of the 2030 targets.
- Among the major economic factors delaying the realization of SDG7 globally are
 - The uncertain macroeconomic outlook,
 - High levels of inflation,
 - Currency fluctuations,
 - Debt distress in a growing number of countries,
 - Lack of financing,
 - Supply chain bottlenecks,
 - Tighter fiscal circumstances, and
 - Soaring prices for materials.
- The effects of the Covid-19 pandemic and the steady rise in energy prices since summer 2021 are expected to be a further drag on progress, particularly in the most

vulnerable countries.

- This particularly concerns lacking universal access to electricity and clean cooking in developing economies, with projections indicating that SDG 7 will not be reached by 2030.
- The uptake of renewable energy has grown since 2010, but efforts must be scaled up substantially, the UN bodies found.
- The rate of improvement in energy efficiency is not on track to double by 2030, with the current trend of 1.8% falling short of the targeted increase of 2.6 % each year between 2010-2030, the report said.
- To support clean energy in developing countries, international public financial flows should be increased but it is declining even before the COVID-19 pandemic.
- Financial flows have shrunk for the 3rd year in a row but they have become increasingly focused in some small number of countries, the UN bodies further said.
- The decreasing trend in international public financial flows may delay the achievement of SDG 7, especially for the least-developed countries (LDCs), landlocked developing countries, and small island developing states.

Reference

[Downtoearth | Universal energy access to all, UN report](#)

Fattah or Conqueror

Iran unveils a hypersonic missile, able to beat air defences amid tensions with U.S.

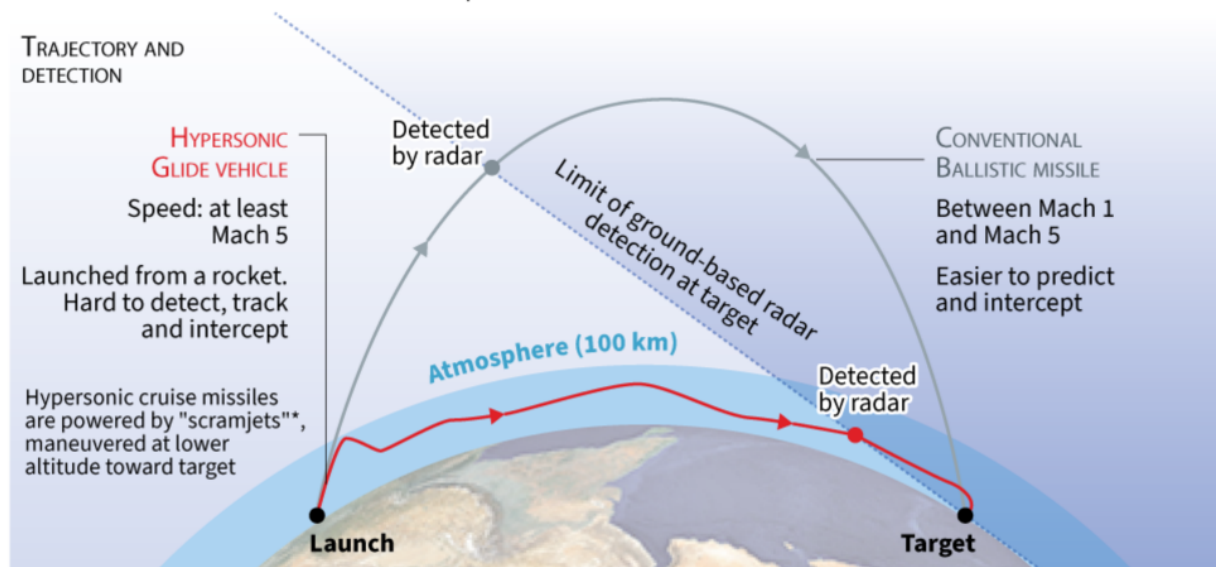
- It is the first-ever domestically-made hypersonic ballistic missile created by Islamic Revolutionary Guard Corps (IRGC), Iran.
- **Islamic Revolutionary Guard Corps (IRGC)** - It is a multi-service (ground, naval, and air forces) primary branch of the Iranian Armed Forces.
- **Speed** - Mach 15
- **Range** - Upto 1400 kms
- It is named by the Iranian Supreme Leader Ayatollah Ali Khamenei 'Fattah' in Farsi, which means conqueror.
- It can bypass the most advanced anti-ballistic missile systems.

Hypersonic Missiles

- Hypersonic missiles are manoeuvrable, unlike the ballistic missiles that follow a set course or a ballistic trajectory.
- It moves at 5 times the speed of sound or greater and are manoeuvrable, making them difficult for defence systems and radars to target.
- Like traditional ballistic missiles, they can deliver nuclear weapons.

Hypersonic weapons

Considered the next generation of arms with conventional or nuclear warheads that are hard to detect and can travel more than five times the speed of sound



Sources: Congressional Research Service/MDAA/UCS/Stratfor/KCNA/FT

*Supersonic combustion ramjets

Agence France-Presse

Reference

[The Hindu | Iran unveils what it calls a hypersonic missile](#)

Manual Scavenging

Ministry of Social Justice and Empowerment report says that only 66% districts in country is free of manual scavenging.

- The International Labour Organization describes 3 forms of manual scavenging in India
 1. Removal of human excrement from public streets and dry latrines (meaning simple pit latrines without a water seal, but not dry toilets in general),
 2. Cleaning septic tanks,
 3. Cleaning gutters and sewers.
- India banned the practice under the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013 (PEMSR).
- The Act bans the use of any individual for manually cleaning, carrying, disposing of or otherwise handling in any manner, human excreta till its disposal.
- In 2013, the definition of manual scavengers was also broadened to include people employed to clean septic tanks, ditches, or railway tracks.
- The Act recognizes manual scavenging as a *dehumanizing practice* and cites a need to correct the historical injustice and indignity suffered by the manual scavengers.

Self-Employment Scheme for Rehabilitation of Manual Scavengers (SRMS)

- It was introduced in 2007.
- **Objective** - To rehabilitate the remaining manual scavengers and their dependents in alternative occupations by March, 2009.
- **Ministry** - Ministry of Social Justice & Empowerment (MoSJE).
- The scheme for rehabilitation of manual scavengers (SRMS) has now been merged with the NAMASTE scheme.
- The FY 2023-24 Union Budget showed no allocation for the rehabilitation scheme and Rs. 100 crore allocation for the NAMASTE scheme.

National Action for Mechanized Sanitation Ecosystem (NAMASTE) Scheme

- It is a central sector scheme for improving the living standards of sanitation workers in urban areas.
- It is a joint initiative of Ministry of Social Justice and Empowerment (MoSJE), Ministry of Housing and Urban Affairs (MoHUA) and Department of Drinking Water and Sanitation.
- **Objectives** - It envisages safety and dignity of sanitation workers in urban India by
 - Recognising sanitation workers as one of the key contributors in the maintenance of sanitation infrastructure
 - Providing them with sustainable livelihood
 - Enhancing their occupational safety through capacity building and improved access to safety gear and machines
 - It aims at provide alternative livelihoods support and entitlements to reduce their vulnerabilities.

References

1. [The Hindu | Only 66% districts in country free of manual scavenging](#)
2. [Indian Express | What is Manual Scavenging](#)