

THE  HINDU  
INDIA'S NATIONAL NEWSPAPER SINCE 1878

# ANALYSIS

**5th MAR, 2023**

# Target

## PRELIMS 2023

Revise Smarter, Score Higher  
with **BYJU'S Exam Prep IAS**

### How to prepare in under 90 days?

Date	Subject	Timing
March 1 <sup>st</sup>	Polity	8 PM to 9 PM
March 2 <sup>nd</sup>	Current Affairs	8 PM to 9 PM
March 3 <sup>rd</sup>	Economy	8 PM to 9 PM
March 4 <sup>th</sup>	Geography	8 PM to 9 PM
March 5 <sup>th</sup>	E&E and S&T	8 PM to 9 PM
March 6 <sup>th</sup>	History	9 PM to 10 PM

# Target PRELIMS 2023

How to Prepare  
for **Science &  
Environment** in  
**Under 90 Days?**

 5<sup>th</sup> March  8 PM - 9 PM



# Topics to be covered:

## Detailed Analysis:

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2. Australia, Japan PMs to visit India ahead of QUAD Summit - Pg 8
3. India-Pakistan: UNSC 1267 Sanctions Committee & Organisation of Islamic Cooperation (OIC) - Pg 10

# Topics to be covered:

## Prelims Bytes:

4. Influenza A H3N2 - Pg 1
5. Great Seahorse migrate from Coromandel coast - Pg 9
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# China takes lead in mapping the deep

A bid for global scientific prestige and the promise of finding mineral wealth are spurring the country's ocean exploration efforts

**Ananth Krishnan**  
SANYA (HAINAN)

It is usually the sightings of the Chinese military's latest warships, and the occasional submarine, that attract the most attention in the crystal clear waters off this tropical island in the South China Sea.

Less noticed are the departures of the *Explorer 2*, a green-and-white vessel that might pass for an unremarkable trawler.

Departing from Sanya's Institute of Deep Sea Science and Engineering (IDSSE), the vessel has made increasingly frequent forays into some of the least explored parts of the world's oceans, carrying with it one of the most advanced deep-sea submersibles, as well as China's ambitions to dominate the still evolving, yet highly competitive, field of deep sea exploration.

So important is the IDSSE's mission to Beijing that when the manned submersible *Fendouzhe*, or *Striver*, plunged to a then record depth of more than 10,000 metres in 2020, Chinese President Xi Jinping sent a letter to the institute, pointing out that "the success of the *Fendouzhe* marks China's ability to enter the world's deepest oceans to carry out scientific exploration and research, and reflects the nation's comprehensive strength in marine high technology fields".

Only the U.S., France and Russia have similar capabilities, say Chinese scientists.

Researchers at the IDSSE say their main mission is understanding what lies at the depths of little understood ocean trenches. The work of deep sea research does, however, also carry the promise of unlocking untold commercial riches, given the growing global interest into deep sea exploration.



**In-depth study:** Li Hangzhou, a submersible pilot, at the Institute of Deep Sea Science and Engineering in Sanya, China. ANANTH KRISHNAN

tion of mineral resources. Copper, gold, minerals and rare earth elements remain untapped on the sea bed.

"How are organisms adapted to life in the extreme environment of the ocean, in this least understood and remote environment? That is what we are exploring," said Zhang Weijia, a deputy researcher at the IDSSE. Ms. Zhang said scientific research is also important in determining how resources can be exploited without damaging ocean environments. "From the ecological perspective, it will be helpful to monitor long-term changes to mining areas, how long it takes to recover, and so on."

In December 2021, the *Striver* explored the Mariana Trench, the world's deepest. At the Kermadec Trench in the Pacific Ocean, Ms. Zhang said, the submersible created several firsts, observing for the first time anemones at a depth of 8,880 metres and fish feeding on shark remains at 9,900 metres.

**CONTINUED ON**  
» PAGE 8

## China takes lead in mapping the deep

"The biggest surprise is we observed a rich food supply at these depths," she said. In the Mariana Trench, new microbes were discovered. The research is at an early stage, but the potential for biotechnology, from new enzymes to treating anti-microbial resistance, is enormous.

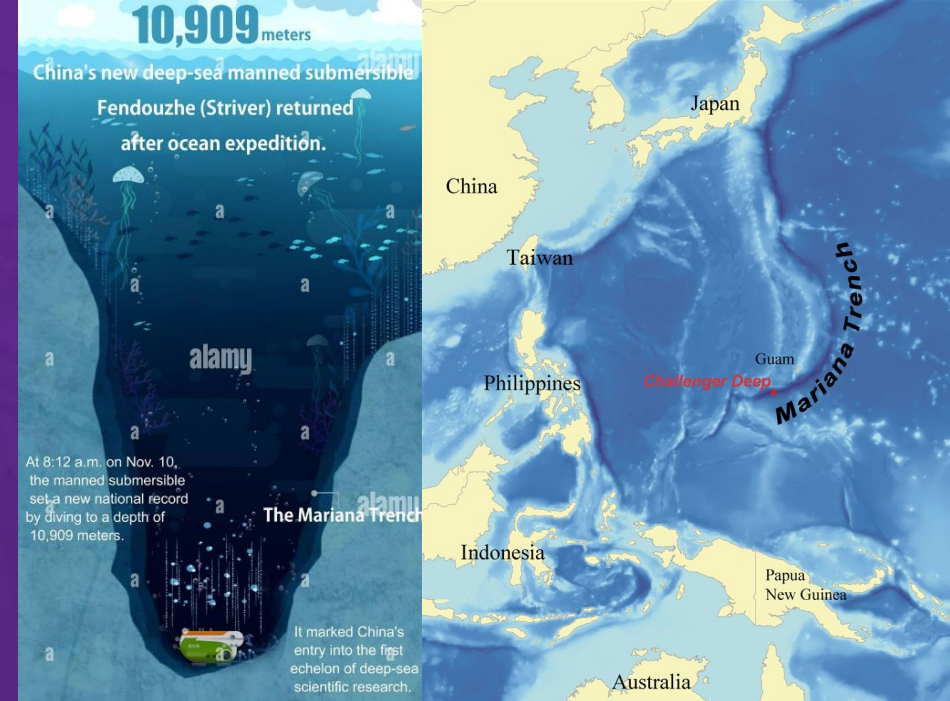
The scientific mission of the IDSSE, which is jointly run by Beijing's elite Chinese Academy of Sciences (CAS), the country's premier scientific institution, and the Hainan provincial government, is in line with Mr. Xi's current push to establish China as a science and technology power. The institute has been given 30 billion Yuan (\$4.3 billion) in grants for the 400 projects it is currently pursuing. Its mission is to create "a China-led global deep sea scientific research programme with joint participation by numerous major international deep-sea research teams". The Kermadec project was run along with New Zealand, while IDSSE is China's designated member of the BRICS "Marine and Polar Science" working group.

It isn't only global scientific prestige that is motivating Beijing to pour money into deep sea research. The work of China's advanced submersibles is also boosting the efforts of the China Ocean Mineral Resource R&D Association (COMRA), a government-backed body spearheading Beijing's plans to develop the world's most advanced deep-sea mining capabilities. China, along with the U.S., Russia, Germany, France, and to a lesser extent, India, are in a race for exploration contracts to search the vast areas under the jurisdiction of the International Seabed Authority (ISA), which includes all waters beyond 12 nautical mile territorial seas and 200 nautical mile exclusive economic zones. China has so far secured several exploration licences in vast areas in the Pacific Ocean and Indian Ocean.

On February 27, 2023, Hong Wang, a senior Chinese official who is Vice-Minister of Natural Resources and Administrator of Oceanic Administration, visited the ISA headquarters in Jamaica, underlining the importance accorded by China to this project. "China strongly supports the mission of ISA to protect the marine environment and sustainably develop mineral resources... for the benefit of all humanity," he said then.

## Context:

- China's Institute of Deep Sea Science and Engineering (IDSSE) has made increasingly frequent forays into some of the least explored parts of the world's oceans.
- It has deployed some of the most advanced deep-sea submersibles, including manned submersibles such as *Fendouzhe* or *Striver* which plunged to a then record depth of more than 10,000 metres in 2020.
- It projects China's ambitions to dominate the still evolving, yet highly competitive, field of deep sea exploration.



# China's Deep Sea Exploration

- China's Ambition:
  - i. Global scientific prestige - Only US, France & Russia
  - ii. Finding mineral wealth - Copper, Gold, Rare Earth Elements etc.
  
- Understanding the extreme environment:
  - Observing for the first time anemones at a depth of 8,880 m.
  - Fish feeding on shark remains at 9,900 m.
  
- It is also important in determining how resources can be exploited without damaging ocean environments.

# China's Deep Sea Exploration

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# China's Deep Sea Exploration

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- China has so far secured several exploration licenses in vast areas in the Pacific Ocean and Indian Ocean.

# China's Deep Sea Exploration

- China has realized the vulnerability of supply chains for critical and strategic minerals.
- China's 'interest' in Pacific Island Nations – BRI
- In 2001, COMRA signed an exclusive contract with the International Sea Authority (ISA) to explore the Clarion-Clipperton Fracture Zone in the North-East Pacific.
- It also later signed new contracts with ISA in 2011 and 2014 to explore polymetallic sulphides and cobalt-rich ferromanganese crusts.

# China's Deep Sea Exploration

- China's deep-sea ambitions aren't limited to the Pacific.
- In 2015, it pitched to the Narendra Modi government the idea of exploring the Indian Ocean for its rich seabed deposits.
- However, the project seems to have fallen through the cracks as geopolitics over the Belt and Road Initiative strained India and China's bilateral relationship.
- At least until 2017, Jialong, China's manned submersible probe, was seen conducting exploratory missions in the northwestern Indian Ocean.
- After failing to progress in deep-sea exploration in the Indian Ocean, China's mining operations have gone ahead with full steam in the Pacific region.

# India's Deep Ocean Mission

- Launched in 2019, it is an Indian initiative to undertake the deep ocean exploration focused on India's exclusive economic zones and continental shelf.
- The program will consist of various crewed and uncrewed submersibles exploring the sea bed.
- NIOT & ISRO are jointly developing a Manned Submersible Vehicle.
- One of the primary aims of the mission is to explore and extract polymetallic nodules, which are composed of minerals like manganese, nickel, cobalt, copper and iron hydroxide.
- India has been allocated a 75,000 km<sup>2</sup> (29,000 sq mi) site in the Central Indian Ocean Basin by the International Seabed Authority for the purposes of exploring for and extracting polymetallic nodules on the seabed.

# International Seabed Authority

- It is a Jamaica-based intergovernmental body of 167 member states and the European Union established under the 1982 UN Convention on the Law of the Sea (UNCLOS) and its 1994 Agreement on Implementation.
- The ISA's dual mission is to authorize and control development of mineral related operations in the international seabed considered the "common heritage of all mankind" and also protect the ecosystem of the seabed, ocean floor and subsoil in "The Area" beyond national jurisdiction.
- The ISA is to safeguard the international deep sea, the waters below 200 meters or 656 feet, where photosynthesis is hampered by inadequate light.
- Governing approximately half of the total area of the world's oceans, the ISA is to exercise oversight of activities that might threaten biological diversity and harm the marine environment.
- The Authority operates as an autonomous international organization with its own Assembly, Council and Secretariat.
- It has observer status to the United Nations.

# Australia, Japan PMs to visit India ahead of Quad summit

The Australian PMO confirmed that Albanese will reach India on March 8 and will watch the fourth Test match between India and Australia with Modi; Japanese PM set to come on March 19

**Kallol Bhattacharjee**  
**Suhasini Haidar**  
NEW DELHI

The Prime Ministers of Australia and Japan will visit India in March in what is being interpreted as a warming of ties ahead of the Quad leaders' summit in Australia.

The Office of the Australian Prime Minister Anthony Albanese on Saturday announced that he will start his March 8-to-11 tour of India from Ahmedabad, where Prime Minister Narendra Modi will join him at the fourth Test match of the Border-Gavaskar Trophy coinciding with Holi. Japanese media has reported that Prime Minister Fumio Kishida will reach Delhi on March 19.

"Our relationship with India is strong, but it can be stronger. It is underpinned by our Comprehensive Strategic Partnership, which underscores a joint commitment to working together to enhance our defence, economic and technological interests," said Mr. Albanese,



Narendra Modi with Australia and Japan PMs Anthony Albanese and Fumio Kishida, and U.S. President Joe Biden in Japan in 2022. AFP

who came to power last May when he had travelled to Tokyo to participate in the Quad leaders' summit hours after being elected to the office after defeating Prime Minister Scott Morrison.

"A shared passion for cricket is a hallmark of our long-standing friendship, a relationship that has been enriched by generations of Indian-Australians," a statement from the PMO of Australia said. The visit is being viewed as an expression of political will to growing bilateral trade, security and people-to-people

contacts that received a major boost when the India Australia Economic Cooperation and Trade Agreement came into force in last December.

Mr. Albanese will spend a day in Mumbai before starting the official part of the visit here. The Ministry of External Affairs (MEA) said the Australian leader will be accompanied by Senator Don Farrell, Minister for Trade and Tourism, and Madeleine King, Minister for Resources and Northern Australia, and senior officials and a high-level business delegation.

"The strategic partnership between the two countries was elevated to a Comprehensive Strategic Partnership in June 2020 which has been strengthened and deepened through frequent high-level exchanges and enhanced cooperation across sectors," the MEA said in a statement.

Japanese media reported that Mr. Kishida is planning to visit India on March 19 for a two-day visit to meet Mr. Modi. According to sources, officials in Tokyo and New Delhi have been trying to match schedules for a meeting, with Japan hosting the G-7 in May and India as G-20 host needing to coordinate their agenda at the highest levels. While an earlier proposed visit by Mr. Modi to Tokyo could not be scheduled, officials hope Mr. Kishida's visit later this month will materialise.

Mr. Modi will be travelling to Hiroshima as India is a special invitee to the G-7 summit on May 19-21, and is expected to then fly to Sydney for the Quad leaders' summit as well.

# What Is The Quad?

The Quad, officially the Quadrilateral Security Dialogue (QSD), is not a formal alliance. It is an informal strategic forum comprising four maritime democracies:

**India, Japan, Australia and the United States**



## PRIMARY OBJECTIVES

Maritime security, addressing climate change, combating Covid-19 pandemic, among others.

**The Quad is also seen as an attempt to counter the growing might of China**

## Quad 1.0 - Creation

2004

Quad's origins can be traced back to the Indian Ocean tsunami when India, along with Japan, the US and Australia, **conducted relief and rescue operations in the region**

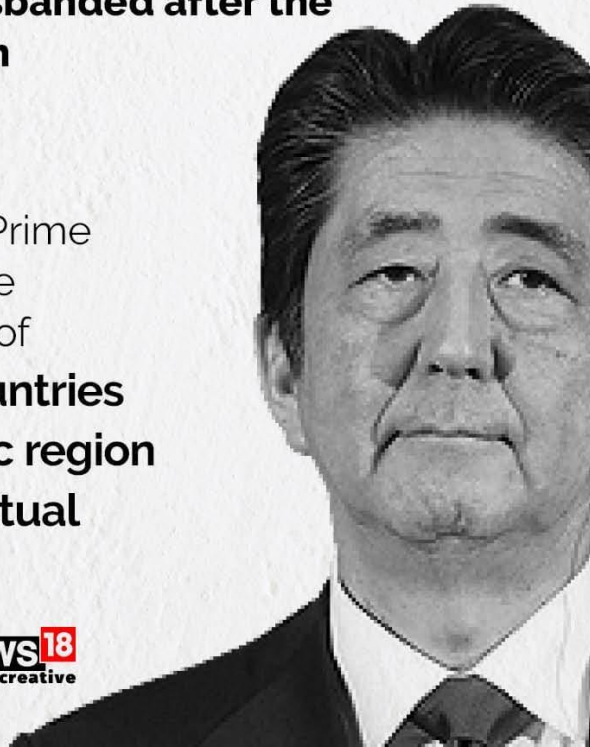


**The group was disbanded after the 2004-05 operation**

2006

Former Japanese Prime Minister Shinzo Abe proposed a group of **"like-minded countries in the Asia-Pacific region on themes of mutual interest"**

NEWS18  
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# RISE, FALL, AND RISE OF THE QUAD

2007

May: **The first informal meeting** between the four countries took place



Sep: Malabar **military exercise** held at an unprecedented scale involving India, Japan, Australia, US, and Singapore



## The fall

2007

Sep: **Shinzo Abe resigned** as Japanese PM



Nov: Quad **critic Kevin Rudd** became PM of Australia; gradually the country backed out of the arrangement (presumably due to pressure from China)



2008

The alliance **gradually fell apart**

## Quad 2.0: Revival

2017

**Japan officially proposed** a revival of the Quad

**The first working-level meeting** under the Quad took place in Manila



2020

**Australia joined** the trilateral India-US-Japan Malabar naval exercise after more than a decade



2021  
Mar  
Quad leaders  
met virtually



Sep  
The first in-  
person meeting  
of Quad leaders

2022  
May | Second in-person summit of Quad leaders



# HOW THE QUAD WORKS



The Quad is a loose grouping rather than a formal alliance. It does not have a **decision-making body** or a secretariat, or a formal structure like NATO or the United Nations



The alliance is maintained through summits, meetings, information exchanges and **military drills**



It doesn't have a rigid framework and nations are free to unlink themselves from **specific Quad initiatives**

# 1st In-Person Summit, 2021 - Spirit of the Quad

- Maritime security
- Quad Vaccine Expert Group - Combating the Covid-19 pandemic
- Quad Critical and Emerging Technology Working Group – Cyber Security, 5G, AI etc.
- Quad Climate Working Group - addressing the risks of climate change
- Making Global Supply Chains resilient
- Space co-operation

# 2nd In-Person Summit, 2022

- Indo-Pacific Maritime Domain Awareness (IPMDA)
- Indo-Pacific Economic Framework (IPEF)

## India slams Pakistan for hosting terrorists designated by UNSC, flays OIC remark on J&K

**Press Trust of India**  
GENEVA

Pakistan has the “unique distinction” of hosting the most number of UNSC-designated terrorists and terror organisations, and its policies are directly responsible for thousands of civilian deaths in the world, India has said as it slammed Islamabad for its “malicious propaganda”

against the country.

“Osama bin Laden lived next to Pakistan’s premier military academy. Its security agencies have nurtured and sheltered Hafiz Saeed and Masood Azhar for decades,” First Secretary of India’s Permanent Mission to UN Seema Pujani said, while exercising India’s right of reply to Pakistan, at the United Nations Human Rights Council

(UNHRC) in Geneva on Friday.

India also assailed the Organisation of Islamic Cooperation (OIC) for its “unwarranted references” to the Union Territory of Jammu and Kashmir and for allowing Pakistan to hijack and misuse its platform for carrying out Islamabad’s “nefarious agenda” against New Delhi.

“As regards the OIC statement, we reject the unwarranted references to the Union Territory of Jammu and Kashmir,” Ms. Pujani said in a statement.

“The fact is that the entire territories of the Union Territories of Jammu and Kashmir and Ladakh have been, are and shall always be part of India. Pakistan is in illegal occupation of Indian territory,” she said.

# UNSC 1267 Sanctions Committee

- The ISIL (Da'esh) and Al-Qaida Sanctions Committee is a committee of the United Nations Security Council tasked with implementing international sanctions against the Islamic State and Al-Qaeda.
- It was established as the Al-Qaida and Taliban Sanctions Committee in 1999, pursuant to UNSC Resolution 1267.
- Three Sanctions:
  1. Freeze financial assets & accounts
  2. Restrict movement
  3. Deny access to arms
- Decision by consensus of 15 UNSC members.

# Organisation of Islamic Cooperation (OIC)

- It was founded in 1969 consisting of 57 member states, with 48 being Muslim-majority countries.
- The organisation states that it is "the collective voice of the Muslim world".
- It works to "safeguard and protect the interests of the Muslim world in the spirit of promoting international peace and harmony".
- Pakistan has misused OIC to target India – Kashmir conflict.

# Prelims Bytes

## Flu alert

Many patients hospitalised with severe acute respiratory infections have tested positive for Influenza A H3N2 virus



**Time to mask up:** The national capital is witnessing a surge in outpatients with respiratory problems. SUSHIL KUMAR VERMA

**Symptoms:** Fever, cough, runny nose, body ache, nausea, vomiting and diarrhoea

■ **Dos:** Washing hands, using mask, avoiding crowds, not touching nose and eyes, taking paracetamol for fever, body ache

■ **Don'ts:** Taking antibiotics without consulting doctor, shaking hands

Source: ICMR

## ICMR: rising cases of cough and fever linked to influenza subtype A H3N2

**Maitri Porecha**  
NEW DELHI

Rising cases of intense cough lasting for over a week coupled with fever, observed in most parts of the country, can be linked to influenza A H3N2, a subtype of a virus that causes flu, the Indian Council of Medical Research (ICMR) said on Saturday.

"Surveillance data from December 15 reflects the rise in number of cases of influenza A H3N2," the health agency has stated.

The ICMR has 30 Viral Research and Diagnostic Laboratories (VRDL) for respiratory virus surveil-

lance. These VRDLs are attached to top medical colleges in different States and gather samples from patients suffering from severe acute respiratory infections (SARI).

In its observations, the ICMR noted that about half of all patients admitted with SARI and patients walking into clinics were found to be afflicted with influenza A H3N2.

At least 92% of the hospitalised SARI patients detected with the virus were showing up with fever and up to 86% have cough.

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- **Humans can be infected with avian, swine and other zoonotic influenza viruses, such as avian influenza virus subtypes A(H5N1), A(H7N9), and A(H9N2) and swine influenza virus subtypes A(H1N1), A(H1N2) and A(H3N2).**
- **Human infections are primarily acquired through direct contact with infected animals or contaminated environments, these viruses have not acquired the ability of sustained transmission among humans.**
- **Avian, swine and other zoonotic influenza virus infections in humans may cause disease ranging from mild upper respiratory tract infection (fever and cough), early sputum production and rapid progression to severe pneumonia, sepsis with shock, acute respiratory distress syndrome and even death. Conjunctivitis, gastrointestinal symptoms, encephalitis and encephalopathy have also been reported to varying degrees depending on subtype.**

## The pathogen

There are four types of influenza viruses: types A, B, C and D:

- Influenza A viruses infect humans and many different animals. The emergence of a new and very different influenza A virus with the ability infect people and have sustained human to human transmission, can cause an influenza pandemic.
- Influenza B viruses circulates among humans and cause seasonal epidemics. Recent data showed seals also can be infected.
- Influenza C viruses can infect both humans and pigs but infections are generally mild and are rarely reported.
- Influenza D viruses primarily affect cattle and are not known to infect or cause illness in people.

# Influenza A

**Influenza type A viruses** are of most significance to public health due to their potential to cause an influenza pandemic. Influenza type A viruses are classified into subtypes according to the combinations of different virus surface proteins hemagglutinin (HA) and neuraminidase (NA). So far there are 18 different hemagglutinin subtypes and 11 different neuraminidase subtypes. Depending on the origin host, influenza A viruses can be classified as avian influenza, swine influenza, or other types of animal influenza viruses. Examples include avian influenza "bird flu" virus subtypes A(H5N1) and A(H9N2) or swine influenza "swine flu" virus subtypes A(H1N1) and A(H3N2). All of these animal influenza type A viruses are distinct from human influenza viruses and do not easily transmit among humans.

Aquatic birds are the primary natural reservoir for most subtypes of influenza A viruses. Most cause asymptomatic or mild infection in birds, where the range of symptoms depends on the virus properties. Viruses that cause severe disease in poultry and result in high death rates are called highly pathogenic avian influenza (HPAI). Viruses that cause mild disease in poultry are called low pathogenic avian influenza (LPAI).

## With overfishing, great seahorses bolt from Coromandel

**Rahul Karmakar**  
GUWAHATI

Extensive fishing off the Coromandel coast could be forcing the great seahorse to migrate laboriously toward Odisha.

Fishing is less intense in the Bay of Bengal off the Odisha coastline. However, the shallow coastal ecosystem of the eastern Indian State may not be the new comfort zone for the fish with a horse-like head, a study published in the latest issue of the *Journal of Threatened Taxa* said.

The study was based on a specimen of a juvenile great seahorse, or *Hippocampus kelloggi*, caught in a ring net and collected from the Ariyapalli fish landing centre in Odisha's Ganjam district. The authors of the study are Anil Kumar Behera and Biswajit Mahari of Berhampur University's De-

partment of Marine Sciences, and Amrit Kumar Mishra of Bombay Natural History Society's Department of Marine Conservation.

### Vulnerable species

There are 46 species of seahorses reported worldwide. The coastal ecosystems of India house nine out of 12 species found in the Indo-Pacific, one of the hotspots of seahorse populations that are distributed across diverse ecosystems such as seagrass, mangroves, macroalgal beds, and coral reefs.

These nine species are distributed along the coasts of eight States and five Union Territories from Gujarat to Odisha, apart from Lakshadweep and the Andaman and Nicobar Islands.

The population of the great seahorse, which is among the



**Found vulnerable:** The great seahorse, one of the nine species found in the Indian coastal ecosystem, is among the eight species tagged 'vulnerable'.

eight species tagged 'vulnerable', is declining due to its overexploitation for traditional Chinese medicines and as an ornamental fish, combined with general destructive fishing and fisheries bycatch, the study said.

"Despite the ban on fishing and trading activities on seahorses from 2001, clandestine fishing and trading still take place in India. This creates immense pressure on the seahorse populations that have a high dependence on local

habitats to maintain their extensive and long-life history traits," it said.

### Long migration

Seahorses are poor swimmers but migrate by rafting – clinging to floating substrata such as macroalgae or plastic debris for dispersal by ocean currents – to new habitats for successful maintenance of their population.

However, the 1,300-km northward migration of the great seahorse from the Palk Bay and the Gulf of Mannar to Odisha is likely a response to extensive fishing activities around the southern coast of India.

The species is abundant off the Coromandel coast (Andhra Pradesh and Tamil Nadu), but is under extensive fishing pressure, with 13 million individuals caught a year, the stu-

dy said.

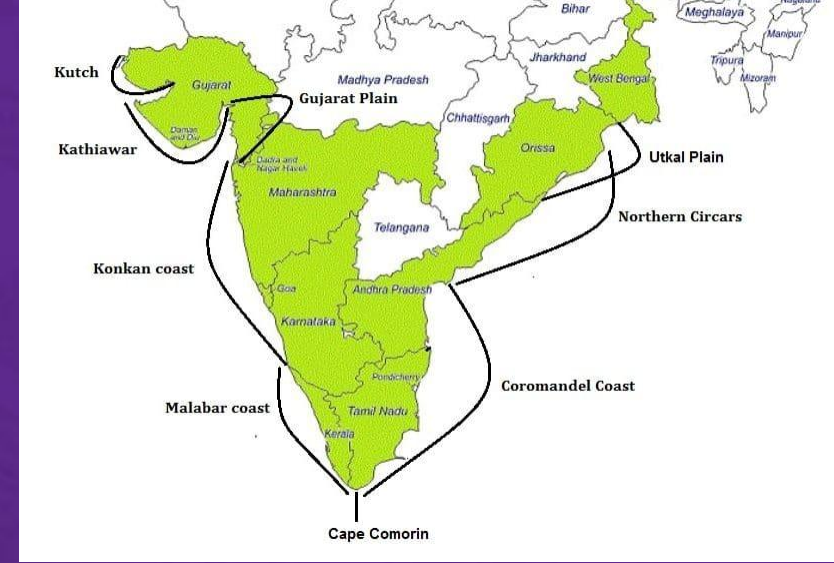
### Need for conservation

"This calls for increased monitoring of the coastal ecosystems of India on the east coast for better conservation and management of the remaining seahorse populations," it advised. However, the great seahorse is not migrating in large numbers, as the Odisha coast does not have coral reefs or seagrass meadows that the species can call home, except within the Chilika region, Mr. Mishra said.

"The intensity of fishing is much lower compared to the Gulf of Mannar and the Palk Bay region. So, even if they migrate northwards, they would not have a suitable habitat, unless the fishing nets that catch them are banned or the fishing practices such as trawling are stopped," he told *The Hindu*.

# Great Seahorse

- Extensive fishing off-the Coromandel coast could be forcing the great seahorse to migrate laboriously toward Odisha.
- There are 46 species of sea-horses reported worldwide.
- The coastal ecosystems of India house 9 out of 12 species found in the Indo-Pacific, one of the hotspots of sea-horse populations that are distributed across diverse ecosystems such as seagrass, mangroves, macroalgal beds, and coral reefs.
- These 9 species are distributed along the coasts of eight States and five Union Territories from Gujarat to Odisha, apart from Lakshadweep and the Andaman and Nicobar Islands.



# Great Seahorse

- Great Seahorse is listed as 'Vulnerable' by IUCN.
- Its population is declining due to its overexploitation for traditional Chinese medicines and as an ornamental fish, combined with general destructive fishing and fisheries bycatch.
- In India, the fishing and trading of seahorses was banned in 2001.
- But clandestine fishing and trading still takes place in India.

# Great Seahorse

- The 1,300 km northward migration of the great seahorse from the Palk Bay and the Gulf of Mannar to Odisha is likely a response to extensive fishing activities around the southern coast of India.
- Bottom trawling, Purse Seine Fishing
- Long migration: Seahorses are poor swimmers but migrate by rafting — clinging to floating substrata such as macroalgae or plastic debris for dispersal by ocean currents — to new habitats for successful maintenance of their population.
- Odisha coast is not a suitable habitat as it does not have coral reefs or seagrass meadows that the Great Seahorse can call home, except within the Chilika region.

## Brus become visible, but their fight for identity continues

The government has seemingly done remarkable work regarding the settlement of the tribe members, providing them basic facilities and livelihood. Most of the voters seemed extremely enthusiastic about having voted in these elections

Sanjay Kumar  
Vibha Attri  
Iyoti Mishra

A large majority of voters in Tripura were eagerly waiting for the election results to see which party will form the government. However, the concern for the people belonging to the Bru tribal community – who exercised their franchise in Tripura for the first time – was related to their identity. It was not that they were uninterested in the verdict, but, one gets the sense that the aspiration for a separate identity looms heavily on their minds.

The Lokniti-CSDS study on the Bru settlements site at Haduklau found that a majority of the families have received most of what was guaranteed in the agreement with the government, but what they are still fighting for is their own identity – for their settlement to be named as Bruhapara (area of Brus).

### The process of settling

A large number of people from this community have been living in camps on the boundary of Mizoram and Tripura due to the reluctance of both State governments to allow them to settle in their territory. They were denied many things, voting rights being one of them. But many Brus who were earlier living in Mizoram were enrolled as voters there. They had been



**A new beginning:** The Bru tribespeople waiting at a polling booth to cast their vote for the Tripura Assembly election. ANI

living in camps in North Tripura for years and were voting in temporary polling booths managed by the Mizoram government. But this practice was not welcomed by the Mizos. During the subsequent revision in the electoral rolls, names of most of the Brus were deleted from the electoral rolls in Mizoram.

The problem did not end here as the people of Tripura were also reluctant to allow Brus to be enrolled as voters in Tripura. They were also denied rations and other State-sponsored facilities.

Clearly, they were neither welcomed by the people of Mizoram nor by the people of Tripura. They were ultimately left to the mercy of the Union government. Finally, the Bru-Reang agreement was signed between the Government of India, the Governments of Tripura and Mizoram and Bru-Reang representatives on January 17, 2020. Of the many promises, one was

that the Bru tribe would get all the rights that normal residents of the State receive and be able to enjoy the benefits of social welfare schemes of both the Union government and the State government.

The Lokniti-CSDS study in the Bru resettlement village in Haduklau in Dhalai district, a few days after election, did indicate a very high enrolment (90%) and an even higher voting (more than 96%) among the Bru tribe.

Most of the voters seemed extremely enthusiastic about having voted in these elections. They also stated that they were getting support from the government for other livelihood issues, besides their voting rights.

The families are entitled to free ration for two years; until the land and jobs that were promised to them are provided by the government.

Most of the families have received the land, the ₹1.5

lakh to build a house alongside and the ₹4 lakh as fixed deposit per family. However, what many of them were still waiting for was the monthly payment of ₹5,000 per family as promised by the government and the land for cultivation which would be their main source of livelihood. At the moment, most of them depend on payment from manual labour, though some have started their own small shops within the settlement.

### The voting experience

Talking about their experience of participating in the electoral process, they said they had to walk for more than two kilometres (on average) to cast their vote, as the school (polling station) was at a considerable distance.

It is worth mentioning that though they did mention walking this distance to cast their vote, it was without any sense of complaint or hardship. They were happy that they were voting for the first time after having settled in the new village. Moreover, this issue will be soon resolved as the construction of a government school was ongoing in the village and would be ready within a month or so.

Besides schools, a temple and a church were being constructed with the help of the government. Many voters mentioned that there was financial

support for building the temple from other groups as well.

Within the Bru community in the settlement, 80% were Hindus and 20% Christians. The houses of Hindus were clearly numbered and marked with the symbol of a *Trishul* on the front wall. This was clearly done to identify themselves as Hindus, though there was no segregation. The houses of Hindus and Christians were in mixed settlement and not segmented.

The government has seemingly done remarkable work regarding their settlement, providing them basic facilities and livelihood.

One hardly comes across such a high enrolment ratio of voters. It is true that the overall turnout in Tripura had been high (88%) – it was higher at 91% in the previous Assembly election – but the turnout among the Bru community in village was extremely high.

(Sanjay Kumar is Professor and co-director Lokniti-CSDS, Vibha Attri and Iyoti Mishra are researchers at Lokniti-CSDS)

(The authors wish to thank ICAS: MP for extending financial support for this detailed case study of the Bru tribes)

(Scan the QR code to read about the methodology of the study)



# Bru Tribe

- Bru or Reang is a community indigenous to Northeast India, living mostly in Tripura, Mizoram and Assam.
- In Tripura, they are recognised as a Particularly Vulnerable Tribal Group.
- In Mizoram, they have been targeted by groups that do not consider them indigenous to the state.
- In 1997, following ethnic clashes, nearly 37,000 Brus fled Mizoram and were accommodated in relief camps in Tripura.
- Since then, 5,000 have returned to Mizoram in eight phases of repatriation, while 32,000 still live in six relief camps in North Tripura.
- The Centre, the governments of Mizoram and Tripura and leaders of Bru organisations signed a quadripartite agreement in January (2020). Under the pact, the Home Ministry has committed to incur the whole expenditure of settlement in Tripura.



## 7. Page 9 – Art & Culture

### Assam's *moidams* fit UNESCO requirements for heritage site

**The Hindu Bureau**  
GUWAHATI

Assam's pyramid-like structures known as *moidams* or *maidams* have met all the technical requirements of UNESCO's World Heritage Centre, Chief Minister Himanta Biswa Sarma has said.

Charaideo in eastern Assam has more than 90 *moidams*, the mound-burial system of the Ahoms who ruled large swathes of the present-day State and beyond for some 600 years until the advent of the British in the 1820s.

"With great pride, happy to share a landmark achievement in our endeavour to get World Heritage Site status for Charaideo Maidams. The *maidams* have met all technical requirements of the UNESCO Secretariat. My gratitude once again to Hon PM Shri @narendramodi ji for the nomination," Mr. Sarma tweeted on the night of Friday.



**Pyramids of Assam:** The *moidams* enshrine the mortal remains of Ahom royalty along with the objects they cherished. SPECIAL ARRANGEMENT

He attached a letter from Lazare Eloundou Assamo, Director of the World Heritage Centre's cultural sector, to Vishal V. Sharma, the Permanent Delegate of India to UNESCO.

"The nomination of *Moidams* - the mound-burial system of the Ahom Dynasty met all of the technical requirements outlined in the Operational Guidelines

concerning completeness check of nominations to the World Heritage List. It is important to recall that the technical completeness of a nomination does not imply that the site concerned is of Outstanding Universal Value and would necessarily be inscribed on the World Heritage List," Mr. Assamo's letter announced.



- The nomination of the Charaideo Maidams has attained significance at a time when the country is celebrating the 400th birth anniversary of Lachit Borphukan.

## UN nuclear head meets with Iranians amid enrichment concerns

**Associated Press**  
DUBAI

The head of the UN nuclear watchdog was meeting with officials in Iran on Saturday, days after it was revealed that the country had enriched particles of uranium to near weapons-grade. The reports had raised fresh alarm over its long-disputed nuclear programme.

Rafael Mariano Grossi, the head of the International Atomic Energy Agency, declined to comment on his discussions during a press conference with the head of Iran's nuclear programme, saying the delegation's work was still ongoing.

"It's an atmosphere of work, of honesty and



**Peace bid:** Iran President Ebrahim Raisi, right, welcoming IAEA chief Rafael Grossi ahead of talks in Tehran on Saturday. AFP

cooperation," Mr. Grossi said. He later met with Iran's President Ebrahim Raisi and was expected to speak with reporters upon his return to Vienna.

Earlier this week, the Vienna-based International

Atomic Energy Agency (IAEA), through a report, had said that uranium particles enriched up to 83.7% – just short of weapons-grade – were found in Iran's underground Fordo nuclear site.

# Scrub typhus: combination therapy can save more lives

Mortality rate was same in the combination therapy arm and two monotherapy arms, but there was faster resolution of complications in the combination therapy group

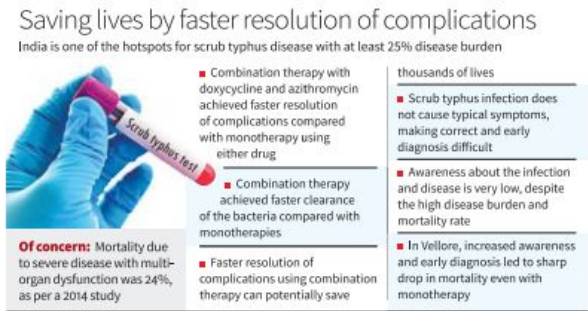
R. Prasad

**S**crub typhus – a life-threatening infection caused by *Orientia tsutsugamushi* bacteria – is a major public health threat in South and Southeast Asia. As per estimates, nearly one million cases are reported from South and Southeast Asia with 10% mortality. India is one of the hotspots with at least 25% of the disease burden; in CMC Vellore alone, 500-1,000 patients are treated each year, of which 250-300 have severe disease.

A seroprevalence study undertaken about five years ago in Vellore, Tamil Nadu, by researchers at the CMC Vellore showed over 30% antibody positivity for the bacteria in the community, indicating that they were exposed to the pathogen.

What makes scrub typhus a major public health threat is the very high mortality rate in patients with severe disease despite diagnosis and treatment. In a study published by CMC Vellore researchers in 2014, the mortality in patients with severe scrub typhus disease with multi-organ dysfunction was 24%.

Till date, monotherapies using either doxycycline or azithromycin was the commonly used treatment. A trial carried out now in seven centres in India where patients were randomly assigned to receive a combination therapy of both doxycycline and azithromycin showed faster resolution of complications compared with two



other arms where patients were given monotherapy of either doxycycline or azithromycin. The trial enrolled nearly 800 patients (265 in the doxycycline group, 263 in the azithromycin group, and 266 in the combination-therapy group). The results were published in *The New England Journal of Medicine*.

"The 28-day mortality was the same (12.1%) in all the three groups. But since we were able to achieve faster resolution of complications at day seven in the combination therapy group, we can potentially save thousands of lives," says Dr. George M. Varghese, Professor at the department of infectious diseases, CMC Vellore, and the primary investigator and corresponding author of the paper.

The frequencies of respiratory, renal, hepatic, and central nervous system complications were lower in the combination-therapy group than in either of the monotherapy

groups. "We need a larger number of patients enrolled in the trial to conclusively prove that faster resolution of complications will result in more lives saved. But it is unethical now to continue the trial as the benefit of the combination therapy over monotherapies has already been established," says Dr. Varghese.

Among the patients who died in the study, 50% died within 48 hours of arrival. This indicates that patients who arrive late with multiple organ dysfunction may have a higher risk of mortality as their condition may have progressed too far for effective treatment.

"This trial has shown that the combination therapy using both doxycycline and azithromycin is far more effective in treating severe scrub typhus than monotherapies of either drug by itself," he says.

#### Treatment guidelines

Until the results of this trial were published, there

were no clear-cut treatment guidelines for severe scrub typhus. Though oral doxycycline was routinely used as a monotherapy, the drug has to be administered intravenously for severe disease.

This made treatment with azithromycin attractive as the intravenous formulation of the drug was widely available.

However, even the largest trial so far, comparing doxycycline and azithromycin, included only less than 100 patients with milder disease.

In contrast, the superiority of combination therapy for severe scrub typhus has been demonstrated by clinical evidence from the largest ever randomised, controlled trial. Second, the combination therapy was able to achieve faster clearance of the bacteria compared with monotherapies.

The faster clearance in the combination therapy arm may be due to the complementary effect of

the drugs.

While azithromycin concentration inside the cells where the bacteria proliferate can be 100 times that of the plasma, doxycycline has higher concentration in the plasma.

The different sites where the two drugs stop the bacteria from producing proteins through different but complementary mechanisms may be the reason why the combination therapy has been able to clear the pathogen faster.

#### No typical symptoms

Scrub typhus is transmitted to humans by bites from tiny infected larvae of mites; mites breed during July-March. Only the larval stage of the mite requires a blood meal, which is usually from rodents.

"The larvae are invisible to the naked eye and the bite is not painful. So people don't realise they have been bitten by an insect and possibly infected," Dr. Varghese says. The infection does not cause typical symptoms, thus, making correct and early diagnosis difficult.

Increasing the awareness can clearly bring down the mortality rate, as demonstrated by the CMC Vellore researchers.

"In 2005-2006, the mortality rate was 15% in patients presenting at our hospital. By building awareness and early diagnosis, we were able to more than halve the mortality from 15% to 6% in about 10 years even with monotherapy," he recalls.

# Scrub Typhus

- It is a disease caused by a bacteria called *Orientia tsutsugamushi*.
- Scrub typhus is spread to people through bites of infected chiggers (larval mites).
- The most common symptoms of scrub typhus include fever, headache, body aches, and sometimes rash.
- Most cases of scrub typhus occur in rural areas of Southeast Asia, Indonesia, China, Japan, India, and northern Australia.
- People with severe illness may develop organ failure and bleeding, which can be fatal if left untreated.
- No vaccine is available to prevent scrub typhus.
- Scrub typhus is generally treated with the antibiotic doxycycline.

## Saving lives by faster resolution of complications

India is one of the hotspots for scrub typhus disease with at least 25% disease burden



■ Combination therapy with doxycycline and azithromycin achieved faster resolution of complications compared with monotherapy using either drug

■ Combination therapy achieved faster clearance of the bacteria compared with monotherapies

■ Faster resolution of complications using combination therapy can potentially save

**Of concern:** Mortality due to severe disease with multi-organ dysfunction was 24%, as per a 2014 study

thousands of lives

■ Scrub typhus infection does not cause typical symptoms, making correct and early diagnosis difficult

■ Awareness about the infection and disease is very low, despite the high disease burden and mortality rate

■ In Vellore, increased awareness and early diagnosis led to sharp drop in mortality even with monotherapy



### Phytoplankton blooms increase in size in 21st century

Coastal phytoplankton blooms increased in both their size and their frequency between 2003 and 2020 (*Nature*). Researchers created a comprehensive map of bloom distribution and trends by assessing 7,60,000 satellite images. The total bloom-affected area in 2020 was 31.47 million sq km (8.6% of the global ocean area). This was an increase of 3.97 million sq km (13.2%) from 2003. The global median frequency also showed an increasing rate of 59.2% over the observed period.

# Phytoplankton Blooms

- Huge blooms of phytoplankton — microscopic algae floating on the ocean's surface — have become larger and more frequent along the world's coastlines.
- Between 2003 and 2020, coastal phytoplankton blooms increased by about 13% in extent, covering an additional 4 million square kilometres of the global ocean.
- This could bring benefits to fisheries but also potentially causing harm.
- While marine animals such as fish and whales eat phytoplankton, it can also prove toxic in large amounts, starving the ocean of oxygen and leading to "dead zones" that wreak chaos on the food chain and fisheries.
- While some regions saw weaker blooms over the past two decades, including the California Current, blooms strengthened in the northern Gulf of Mexico and the East and South China Seas.

# Phytoplankton Blooms

- What's driving the increase in phytoplankton blooms varies by region, scientists said.
- In some cases, warmer sea surface temperatures appear to be behind the boom.
- Changes in climate can also mess with ocean circulation, affecting mixing between ocean layers and how nutrients move around the ocean.
- Human development also plays a role. Fertilizer runoff from agriculture can spike nutrient loads in the ocean, leading to blooms.
- Researchers also found that more aquaculture around places like Finland, China, and Vietnam might be associated with more algal blooms.
- Another factor: Relationships between population increases along coastal areas and bloom increase. This would be especially relevant for some countries in the southern hemisphere where a major part of the domestic waste is not treated.

# Mains Practice Questions

1. What is the significance of deep sea exploration? Examine the progress China and India have made in this regard. (250 words, 15 marks)
2. Evaluate the evolution of QUAD and how the group is relevant for India? (250 words, 15 marks)

THE  HINDU  
INDIA'S NATIONAL NEWSPAPER SINCE 1878

# ANALYSIS

**5th MAR, 2023**