

JULY

8

# CRUX 10

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MK Yadav Sir

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# Banks submit expected credit loss impact estimates to RBI

Shayan Ghosh

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MUMBAI

**B**anks have informed the Reserve Bank of India (RBI) about the financial impact of a proposed regime where they have to make early provisions for the loans they expect to sour, the regulator's response to a Right to Information (RTI) request showed.

The so-called expected credit loss (ECL) model proposed by the regulator earlier this year, where banks have to recognize stress much earlier, is in contrast to the existing regime where banks make provisions after the losses are incurred.

On 16 January, RBI released a discussion paper on shifting from the incurred-loss approach to the ECL model, a transition aimed at making the banking system more resilient. The regulator sought comments by 28 February.

*Mint* filed an RTI request



Banks have responded to the RBI on its query. MINT

seeking a copy of the comments received from stakeholders but was informed by the central public information officer, Deepak Chikhale, that the information was exempt from disclosure. Thereafter, RBI executive director Radha Shyam Ratho responded to an appeal and directed the CPIO to revisit the query and provide a revised reply.

"Some of the feedback contains data on the plausible financial impact on these enti-

ties, which, if made public now, might be misused and misconstrued, thereby impacting the competitive interest of these entities," Chikhale said in a revised response.

RBI also said that the information being sought—stakeholder comments on the discussion paper—concerns an upcoming regulation, and releasing related documents in the public domain before the issue of final guidelines may affect an objective examination of the issues.

In their responses to the draft circular, lenders have pointed out certain provisions they are uncomfortable with. According to the chief financial officer at a public sector bank, the new regulation proposes a waiting period before upgrading a loan account after payments are regularized.

Analysts' estimates peg the impact of ECL on the core capital of banks at 200 basis points

**Context:** Banks have informed the Reserve Bank of India (RBI) about the financial impact of a proposed regime where they have to make early provisions for the loans they expect to sour.

- The so-called **expected credit loss (ECL) model** proposed by the regulator earlier this year, where banks have to recognize stress much earlier, is in contrast to the existing regime where banks make provisions after the losses are incurred.

## Expected Credit Loss (ECL)

- **About:** Under this practice, a **bank is required to estimate expected credit losses** based on forward-looking estimations rather than wait for credit losses to be actually incurred before making corresponding loss provisions.
  - As per the proposed framework, **banks will need to classify financial assets** (primarily loans) as Stage 1, 2, or 3, depending on their credit risk profile, with Stage 2 and 3 loans having higher provisions based on the historical credit loss patterns observed by banks.
  - This will be **in contrast to the existing approach of incurred loss provisioning**, whereby step-up provisions are made based on the time the account has remained in the Non-Performing Asset (NPA) category.
- **Benefits:**
  - It will **result in excess provisions** as compared to a shortfall in provisions, as seen in the incurred loss approach.
  - It will further **enhance the resilience of the banking system** in line with globally accepted norms.

# Centre calls alleged FAME defaulters for hearing from July 13

Either return subsidy or face legal action: govt to firms

SURAJEET DAS GUPTA & NITIN KUMAR  
New Delhi, 7 July

The Ministry of Heavy Industries (MHI), starting July 13, will hold court with electric two-wheeler manufacturers that have allegedly violated Phased Manufacturing Programme (PMP) guidelines under the Faster Adoption and Manufacturing of (Hybrid & Electric Vehicles in India (FAME-II) scheme. The manufacturers include top electric two-wheeler players like Hero Electric and Okinawa.

The hearing aims to give the companies a chance to accept the government formula by which the alleged violators have to return the subsidy claimed to the government and forgo the subsidy given after their disqualification from the scheme, *Business Standard* has learnt.

This comes after MHI officials held a meeting with industry representatives this week. If the companies refuse to agree to the formula, the government is looking at taking legal action against the violators, senior government offi-

## EV TWO-WHEELER SALES DIP 56% IN JUNE ON FAME-II SUBSIDY CUT



The government's decision to slash the FAME-II subsidy of electric two-wheelers has led to a fall of 56.3 per cent in its sales during the month of June, compared to May this year. However, on a year-on-year basis, it saw a marginal increase of 3.21 per cent, said data shared by the Federation of

Automobile Dealers' Associations (Fada) on Friday.

Interestingly, the share of EVs in the overall two-wheeler sales for the month was seen at 3.5 per cent, compared to 7 per cent in May 2023 and 3.6 per cent in June 2022.

SHINE JACOB

**Context:** The Ministry of Heavy Industries (MHI) will hold court with electric two wheeler manufacturers that have allegedly violated Phased Manufacturing Programme (PMP) guidelines under the **Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India (FAMEII) scheme.**

- The hearing aims to give the companies a chance to accept the government formula by which the alleged violators have to return the subsidy claimed to the government and forgo the subsidy given after their disqualification from the scheme.

### FAME India

- **About:** FAME (Faster Adoption and Manufacturing of Electric Vehicles) India is a part of the National Electric Mobility Mission Plan.
  - Main thrust of FAME is to **encourage electric vehicles** by providing subsidies.
- **Implementing agency:** The **Department of Heavy Industry** is administering the scheme "Faster Adoption and Manufacturing of Electric and Hybrid Vehicles in India", popularly known as FAME India scheme since **01st April 2015..**
- **Objective:** Promotion of Electric and hybrid vehicle in the country by offering upfront **Incentive on purchase of Electric vehicles** and by establishing charging Infrastructure for electric vehicles.
- **Salient features of the FAME scheme - 2:**
  - The scheme with total outlay of Rs 10,000 Crores over the period of three years (2019-20 to 2021-22) will be implemented with effect from 1st April 2019.
  - This scheme is the expanded version of the present scheme titled '**FAME India-1** which was launched on 1st April 2015, with total outlay of Rs. 895 crores.
  - **Target** is to support 10 Lakhs e-2Wheeler, 5 Lakhs e-3 Wheelers, 55000 4Wheelers and 7000 Buses.
  - Under the scheme of FAME-II, the **demand incentive** for e-2W has been increased to Rs. 15,000/KWh from Rs. 10,000/KWh with an increase in cap from 20% to almost 40% of the cost of the vehicle to increase the adoption of e-2W.
  - The phase II of FAME-India Scheme has been **extended for a period of two years after 31st March 2022.**
- **Benefits:** The scheme will help in **addressing the issue of environmental pollution and fuel security.**

# Govt. to share PM Gati Shakti data

Industry and potential investors will have access to infrastructure data captured on the PM Gati Shakti platform, according to a top government official; data sharing to be compatible with the policies of the Science and Electronics & IT ministries

Vikas Dhoot  
NEW DELHI

The government is working out a mechanism to share data with industry and potential investors about multi-modal connectivity as well as other physical and social infrastructure captured on the PM Gati Shakti platform, a top official said on Friday.

The Network Planning Group (NPG) under the platform which has multiple layers of geospatial data from across the country, has so far managed to evaluate and facilitate 85 large

## Data rush

The Centre is planning to allow industry and investors to tap into data collected under the PM Gati Shakti plan



- The Gati Shakti portal has multiple layers of geospatial data from across the country
- Gati Shakti's Network Planning Group has so far evaluated 85 large central infrastructure projects
- Ministries are currently working out what data can be shared with industry and investors

central infrastructure projects worth nearly ₹5.4 lakh crore so far, said Sumita Dawra, Special Secretary in the Department for Promotion of Industry and

Internal Trade (DPIIT).

At the NPG's 51st meeting chaired by DPIIT Secretary Rajesh Kumar Singh on Friday, the group evaluated five national high-

way projects worth ₹15,600 crore, which included two highways in Maharashtra, a ring road around Kanpur, and a tunnel project in Mizoram to help commuters and goods bypass the capital city of Aizawl.

A clutch of projects worth ₹719 crore, which are essentially disaster risk mitigation measures for Uttarakhand's Garhwal region, were also taken up. These include 20 road stretches prone to landslides and 11 sinking zones.

Responding to a query from *The Hindu* on when the Gati Shakti portal may

be opened up for investors and other stakeholders outside government, Ms. Dawra said the issue was discussed and ministries were working together to reach a consensus on the modalities.

"Geospatial data sharing has to be compatible with the Science Ministry's policy, while the Ministry of Electronics and IT has been asked to examine issues relating to data protection and privacy. All ministries are working out what data can be shared," she said, without indicating a time frame for implementation.

**Context:** The government is working out a mechanism to share data with industry and potential investors about multi-modal connectivity as well as other physical and social infrastructure captured on the **PM Gati Shakti platform**.

- The Network Planning Group (NPG) under the platform which has multiple layers of geospatial data from across the country, has so far managed to evaluate and facilitate 85 large central infrastructure projects worth nearly ₹5.4 lakh crore so far.

## PM Gati Shakti

- **About:** PM Gati Shakti plan envisages a **centralised portal to unite the infrastructural initiatives** planned and initiated by as many as 16 central ministries and departments.
- **Objectives:** GatiShakti targets to **cut logistic costs, increase cargo handling capacity** and reduce the turnaround time.
  - It is a **campaign to lend more speed (Gati) and power (Shakti)** to projects by connecting all concerned departments on one platform.
  - This way, the **infrastructure schemes of various ministries** and state governments will be designed and executed with a common vision.
- **Pillars:** PM Gati Shakti is based on six pillars: **Comprehensiveness, Prioritization, Optimization, Synchronization, Analytics and Dynamic**.

## GATI SHAKTI MASTER PLAN

Roadways capacity to be increased



**Around 200** new airports, heliports and water aerodromes envisioned

Railways transport cargo capacity to be increased to **1,600 tonnes** by FY25



Transmission network to be increased to **4,54,200 circuit km**

Renewable capacity to be increased to **225 GW** by FY25



**4G** connectivity for villages by FY22. **Around 20** new mega food parks



# NRF Bill: Industry SPV to Identify Tech Gaps, Drive & Fund R&D

₹36,000 cr aimed to be raised via industry-academia collaboration in five years; ₹14,000 crore will be government backed.

Anubhuti.vishnoi  
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**New Delhi:** A Special Purpose Vehicle of top industry that will identify technology gaps and fund research and development (R&D) in Indian institutes has been planned under the upcoming National Research Foundation (NRF) Bill, 2023, recently cleared by the Cabinet.

The consortia will define the 'problem' or gap and fund research on the same at institutes, centres at in-

stitutes and groups of institutes, sources in the know said.

Industry-academia collaboration and limited institutional level research spread are the key missing piece in India's R&D ecosystem.

The NRF hopes to address it through a multipronged strategy that will facilitate industry ownership of R&D initiatives and drive it down to the states.

Critical to it is the funding plan that will be detailed in the Bill.

The upcoming Bill proposes to set up NRF—an apex body to provide

## FOCUS ON STATE-LEVEL INSTITUTIONS



Centre will roll out a three-pronged strategy to ensure that state-level institutions are also made industry-ready

high-level strategic direction of scientific research in the country—at a total estimated cost of ₹50,000 crore during five years (2023-28).

Of the ₹50,000 crore outlay of five years announced for NRF, ₹14,000 crore will be government backed.

The Centre hopes to raise the remaining ₹36,000 cr from private sector:

An SPV, consortia of Indian industry, is likely to be set up to take ownership of and drive the research agenda to meet specific technological/research gaps which are identi-

fied by the industry itself, ET gathers. "The idea is to let the industry itself take full ownership and drive R&D in problem areas and gaps by funding it in institutes...", a person in the know told ET.

Since decentralisation and expansion of R&D beyond the 150 odd IITs, IISERs, IISc is also an ambition under NRF, the Centre will roll out a three pronged strategy to ensure that state level institutions are also made industry ready.

First, focus will be on state level human resources. Intensive training

programmes, fellowships and international exposure modules are planned to be brought in to ensure post-doctoral candidates meet quality benchmarks.

In the second phase, the Centre plans to start creating R&D infrastructure, laboratories, computing resources and modern scientific equipment across identified institutes.

The third phase will be to ensure research fund flow across these institutes—through both the government coffers as well as through industry linked projects.

**Context:** A Special Purpose Vehicle of top industry that will identify technology gaps and fund research and development (R&D) in Indian institutes has been planned under the upcoming **National Research Foundation (NRF) Bill, 2023**, recently cleared by the Cabinet.

- The NRF hopes to **address it through a multipronged strategy** that will facilitate industry ownership of R&D initiatives and drive it down to the states.
- The **upcoming Bill proposes to set up NRF** - an apex body to provide high-level strategic direction of scientific research in the country - at a total estimated cost of ₹50,000 crore during five years (2023-28).

## National Research Foundation

- The government has approved the establishment of the **National Research Foundation (NRF)**, a new central entity aimed at funding, promoting, and mentoring scientific research in higher educational institutions across the country.
- The primary goal of the NRF is to **foster a vibrant research culture within universities and colleges**, marking a new era in Indian academia.
- The concept of the NRF was first **introduced by Prime Minister in January 2019** at the Indian Science Congress.
- The NRF will be **administratively housed under the DST** and will be governed by a 16-member board, comprising two members from DST, five from industry, one from humanities, and six experts selected based on the project under review.
- The **Prime Minister will serve as the ex-officio president** of the board, with the Minister of Science and Technology and the Minister of Education as ex-officio vice presidents. The executive council, overseeing the NRF's functioning, will be chaired by the Principal Scientific Advisor to the government of India.

# Ministry of Education releases report on Performance Grading Index 2.0 for States/UTs for the year 2021-22.

**Context:** Department of School Education & Literacy, Ministry of Education, devised **Performance Grading Index (PGI)** for States and UTs which assesses the performance of school education system at the State/UT level by creating an index for comprehensive analysis.

**Key Points**

- The PGI - States/UTs was **first released for the year 2017-18** and so far, has been released up to the year 2020-21.
- The **new PGI structure covers 73 indicators**, focused more on qualitative assessment besides including digital initiatives and teacher education.
- The grades/level obtained by States/UTs in previous edition of the PGIs are thus not comparable as with the grades/levels obtained by States/UTs in this new edition.
- The **PGI 2.0 structure comprises of 1000 points** across 73 indicators grouped into 2 categories viz., Outcomes, Governance Management (GM).
- These categories are further divided into 6 domains, viz., **Learning Outcomes (LO), Access (A), Infrastructure & Facilities (IF), Equity (E), Governance Process (GP) & Teachers Education and Training (TE&T).**
- PGI 2.0 for 2021-22 classified the States/UTs into ten grades viz., **highest achievable Grade is Daksh, which is for State/UT scoring more than 940 points out of total of 1000 points.**
- The lowest grade is **Akanshi-3** which is for score up to 460.
- The ultimate aim of PGI 2.0 is to propel States & UTs towards undertaking multi-pronged interventions that will bring about the much-desired optimal education outcomes covering all dimensions.
- Indicators of PGI 2.0 have been aligned to policy initiatives and interventions introduced post implementation of **National Education policy (NEP) 2020** for proper tracking the progress.
- The PGI 2.0 is expected to **help States and UTs to pinpoint the gaps** and accordingly prioritize areas for intervention to ensure that the school education system is robust at every level.
- PGI 2.0 scores and grades achieved by States/UTs in 2021-22 bear a **testimony to the efficacy of the PGI system.**
- The indicator-wise PGI 2.0 score shows the areas where a State/UT needs to improve.

## No state in top 5 grades of school performance index

### **PUNJAB, RAJ, CHANDIGARH BEST IN LEARNING OUTCOMES**

Grade	Overall grade Score	States/UTs attaining overall grade	Learning Outcomes	Access	Infra	Equity	Governance Processes	Teacher education & Training
<b>Daksh</b>	941-1000	NIL	NIL	Delhi	NIL	Delhi	NIL	NIL
<b>Utkarsh</b>	881-940	NIL	NIL	8	NIL	31	NIL	Gujarat, Tamil Nadu, Kerala, Delhi, Chandigarh
<b>Atti-Uttam</b>	821-880	NIL	NIL	10	NIL	4	Gujarat	10
<b>Uttam</b>	761-820	NIL	NIL	12	Chandigarh	NIL	Kerala	13
<b>Prachesta -1</b>	701-760	NIL	NIL	4	5	NIL	11	5
<b>Prachesta -2</b>	641-700	2 (Chandigarh, Punjab)	Punjab, Chandigarh & Rajasthan	1	10	NIL	15	2
<b>Prachesta -3</b>	581-640	6	4	NIL	14	NIL	7	1
<b>Akanshi-1</b>	521-580	13	19	NIL	6	NIL	1	NIL
<b>Akanshi-2</b>	461-520	12	10	NIL	NIL	NIL	NIL	NIL
<b>Akanshi-3</b>	401-460	3	NIL	NIL	NIL	NIL	NIL	NIL

Indian education system is one of the largest in the world with about 14.9 lakh schools, 95 lakh teachers, and nearly 26.5 crore students

## Atal Innovation Mission launches 'ATL Industry Visit' in collaboration with Bayer

**Context:** The **Atal Innovation Mission (AIM)** in collaboration with Bayer launched a unique industry visit initiative under **Atal Tinkering labs**, at Bayer's manufacturing facility in Vapi, Gujarat.

- This initiative with Bayer will help in fuelling the young minds at the Atal Tinkering Labs towards manufacturing. This will in turn help India in taking small steps to becoming an economic global powerhouse.

### Atal Innovation Mission (AIM)

- **About:** The Indian **Government's flagship program** to foster a culture of entrepreneurship and innovation.
- **Objective:** To develop new programmes and policies for fostering innovation in different sectors of the economy, provide platform and collaboration opportunities for different stakeholders, create awareness and create an umbrella structure to oversee the innovation ecosystem of the country.
- **Funding:** AIM **provides grant-in-aid** that includes a one-time establishment cost of Rs. 10 lakh and operational expenses of Rs. 10 lakh for a maximum period of 5 years to each ATL.
- **Components of the AIM:** Atal Tinkering Labs, Atal Incubation Centres, Atal New India Challenge, Mentor of Change Program, Atal Community Innovation Center and Atal Research & Innovation for Small Enterprises (ARISE)
- **Game Development module:** AIM has launched the **Game Development module as part of the 'Tinker from Home' campaign**.
  - It is an **online platform** through which students can learn to create their own games and also share it with others. This platform envisages to make students transition from 'game players' to 'game makers'.

### Atal Tinkering Labs programme

- **About:** A sub-mission under the Atal Innovation **Mission to nurture an innovative mindset** amongst high school students across the length and breadth of India.
- **ATL Eligibility:** ATL's would be set up by schools (having grades VI to X) that are managed by the government, local bodies, private trusts or societies, etc.
- **Features of Atal Tinkering Labs:** A work space where **young minds can give shape to their ideas** through hands on do-it-yourself mode; and learn innovation skills. Young children get a chance to work with tools and equipment to understand the concepts of STEM (Science, Technology, Engineering and Math).
- **'Tinker from Home' campaign:** In **Covid-19**, the ATL program has launched a 'Tinker from Home' campaign to ensure that the children across the county have access to useful easy-to-learn online resources to keep themselves fruitfully occupied.

### United Nations International Maritime Organization agrees to reach net zero “by or around” 2050

Maritime shipping is responsible for 3% of global anthropogenic Greenhouse House Gas emissions, says the IPCC's 2022 report

#### Green House Gas Strategy

To reduce sea freight-related carbon emission **by 40% by 2030 and 70% by 2050**, compared to 2008 levels.



#### IMO 2020

To reduce the concentration of sulphur oxide in the ship fuel from 3.5% to 0.5%.



#### IMO 2023

To reduce carbon emissions from ships via measuring energy efficiency metrics. (EEXI and CII)

**Context:** Maritime countries upgraded their Greenhouse House Gas (GHG) emissions strategy to reach **net zero “by or around” 2050** without specifying a definite year and taking into account different national circumstances, at the conclusion of the summit of the United Nations International Maritime Organization (IMO).

- The **Marine Environment Protection Committee (MEPC) - 80th session** was held at the IMO headquarters from July 3-7.

#### Key Points

- The adoption of the **2023 IMO Greenhouse Gas Strategy** is a monumental development for IMO and opens a new chapter towards maritime decarbonization.
- The 2023 IMO GHG Strategy adopted calls for the international shipping industry **“to reduce the total annual GHG emissions from international shipping by at least 20%, striving for 30%, by 2030, compared to 2008.”**
- It also urged the industry **“to reduce the total annual GHG emissions from international shipping by at least 70%, striving for 80%, by 2040, compared to 2008.”**
- The carbon intensity of international shipping should decline to reduce CO2 emissions **“per transport work”**, on average by at least 40 per cent by 2030, compared to 2008 baseline levels.

## DIARRHOEA CAUSING PATHOGENS

(Syllabus: GS Paper 3 - Sci & Tech)

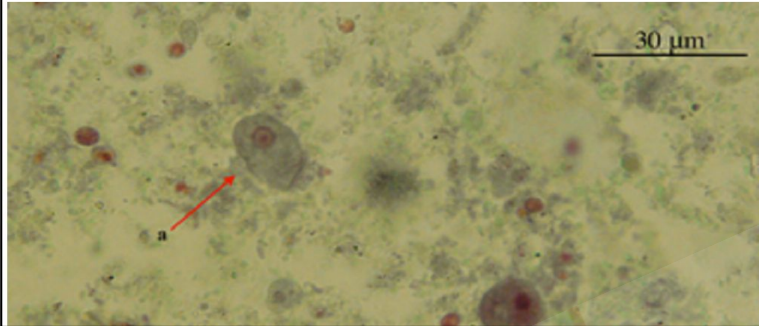
### Diarrhoea-causing pathogen becoming prevalent in Kolkata, prevention & control strategies needed: Study

Children were found to be more susceptible to *Entamoeba moshkovskii* infection



NEXT NEWS >

By Rohini Krishnamurthy  
Published: Friday 07 July 2023



### Diarrhoea

- Diarrhea is the condition of having at least **three loose, liquid, or watery bowel movements each day**.
- The most common cause is an **infection of the intestines** due to either a virus, bacterium, or parasite - a condition also known as gastroenteritis.
- Diarrhea can be **prevented by improved sanitation, clean drinking water, and hand washing with soap**.

**Context:** A pathogen associated with **diarrhoea** is circulating in Kolkata, according to a new study.

### Key Points

- The pathogen in question is ***Entamoeba moshkovskii***. First described in 1941 in Moscow, it is commonly found in **anoxic sediments (oxygen deficient)** to brackish coastal pools.
- The pathogen has been reported in countries such as the United States, Italy, Iran, Turkey, Bangladesh, India (Puducherry), Kenya, Australia, Indonesia, Colombia, Malaysia, Tunisia, Tanzania and Brazil.
- ***E moshkovskii*** and other related species like ***E histolytica*** and ***Entamoeba dispar*** are morphologically identical.
- They also cause amoebiasis, which affects approximately 50 million people in tropical regions and causes nearly 100,000 **deaths annually**.
- **Of them, *E histolytica* infections are prevalent.** *E moshkovskii* is significantly more prevalent than *E histolytica*
- **Children** were found to be more susceptible. The prevalence was the highest among those aged 5-12 and lowest among 19-29 age groups.

## THE 'BRAIN-EATING AMOEBIA' THAT HAS KILLED A TEENAGER IN KERALA

ANKITA UPADHYAY  
NEW DELHI, JULY 7

A 15-YEAR-OLD boy in Kerala's Alappuzha district has died due to a rare infection caused by *Naegleria fowleri* or "brain-eating amoeba" after a week of high fever and rapid deterioration in his vitals. The teen used to bathe in a stream, which is the likely source of the amoeba.

### Naegleria fowleri

The single-cell organism can be seen only under a microscope, and is found in warm freshwater environments such as lakes, rivers, and springs. It survives on bacteria in the sediment in lakes and rivers.

In very rare cases, it may be found even in swimming pools and water bodies in entertainment parks, especially if they are poorly maintained and not well-chlorinated. It cannot survive in saline conditions, and is therefore not found in seawater.

### Infection in humans

The amoeba enters the body through the nose and travels to the brain, and diving or jumping into a river or lake can force water up the nose. Infection leads to a severe and usually fatal brain infection known as primary amoebic meningoencephalitis (PAM).

Although the amoeba is vulnerable in its maturing or trophozoite phase, as a cyst it becomes resistant to its environment. Unlike trophozoites, which are

killed rapidly by refrigeration, cysts can survive even extreme cold.

Last December, a 50-year-old South Korean man and, in March, a man in Florida succumbed to the infection. Dr P N Renjen, Senior Consultant, Neurology, at Indraprastha Apollo Hospitals, New Delhi, said warm water temperatures, particularly during summer create favourable conditions for the amoeba's growth. "And such conditions are not rare in India," Dr Renjen said.

### Prevention, treatment

The infection does not spread from person to person. Preventive measures such as avoiding warm freshwater bodies with inadequate chlorination, using nose clips, and using sterile water for nasal cleansing rituals can help reduce the risk of contracting *Naegleria fowleri* infection.

The amoeba causes inflammation and destruction of brain tissue. Symptoms that usually appear within a week of infection, include severe headache, fever, nausea, vomiting, stiff neck, confusion, seizures, and hallucinations. As the infection progresses, the patient can slip into coma and ultimately die.

The US CDC recommends treatment with a combination of drugs that often includes amphotericin B, azithromycin, fluconazole, rifampin, miltefosine, and dexamethasone. Miltefosine, the newest of these drugs, has been shown to kill *Naegleria fowleri* in the laboratory, and has been used to treat three survivors.

**Context:** A 15-year-old boy in Kerala's Alappuzha district has died due to a rare infection caused by *Naegleria fowleri* or "brain-eating amoeba" after a week of high fever and rapid deterioration in his vitals.

### Naegleria fowleri

- **About:** *Naegleria fowleri*, commonly known as "brain-eating amoeba," is a **single-cell organism found in a warm freshwater** environment such as lakes, hot springs and even in poorly maintained swimming pools.
  - Only one species of *Naegleria*, ***Naegleria fowleri***, infects people.
  - In very rare instances, *Naegleria fowleri* has been **found in swimming pools, splash pads, surf parks, or other recreational venues** that are poorly maintained or don't have enough chlorine in them.
- **Spread and Transmission:** The amoeba **enters the body through the nose and travels to the brain**, leading to a severe and usually fatal brain infection known as primary amoebic meningoencephalitis (PAM).
  - It grows best at temperatures **above 46 degree celsius**.
  - **Warm water temperatures**, particularly during the summer months, create favourable conditions for the amoeba's growth.
  - **Poorly maintained swimming pools** or contaminated water sources increase the risk of exposure.
  - Activities like diving or jumping into warm freshwater bodies can force water up the nose, providing an entry point for the amoeba.
  - **It does not spread from person to person**, nor does it manifest symptoms when contracted in other forms.
- **Preventive measures:** Avoiding warm freshwater bodies with **inadequate chlorination**, using nose clips during water-related activities, and using sterile water for nasal cleansing rituals can help reduce the risk of contracting *Naegleria fowleri* infection.
- **Treatment:** The US-based Centers for Disease Control (CDC) recommends treatment with a combination of drugs, often including **amphotericin B, azithromycin, fluconazole, rifampin, miltefosine, and dexamethasone**.
  - **Miltefosine** is the newest of these drugs. It has been shown to kill *Naegleria fowleri* in the laboratory and has been used to treat three survivors.

## 'A positive IOD can enable a normal Indian monsoon'



**Indrani Roy** is a climate scientist at University College London (UCL). Speaking to Times Evoke, she discusses winds and waters in India's monsoon:

I mainly research solar variability, atmosphere-ocean coupling, climate change, the monsoon and teleconnection. The Indian summer monsoon (ISM) is heavily influenced by the El Niño-Southern Oscillation (ENSO) phenomenon, generated by complex interactions between the atmosphere and oceans. One of Earth's most important modes of tropospheric variability, this influences the world through atmospheric teleconnection.

ENSO is the periodic variation of sea surface temperatures (SST) in east to central tropical Pacific which happens every two to three years. When the SST warms, we have a warm event ENSO phase. When it cools, it generates a cold event phase. The

former is called El Niño and the latter La Niña. The monsoon from June to September is significantly impacted by the prevalent ENSO phase — warm ENSO phases generally yield less rain while cold ENSO phases bring more. Drought years in India often align with El Niños while floods match La Ninas.

The east-west Walker circulation of air flow, originating in the tropical Pacific, also plays a role in this teleconnection.

Interestingly, in 1999, a new mode in the Indian Ocean, termed the Indian Ocean Dipole (IOD), was discovered. This also has a strong influence on the Indian summer monsoon. The IOD Index is measured by differences in sea surface temperature anomaly between the western equatorial and south-eastern equatorial portions of the Indian Ocean. During a positive IOD phase, India receives more rain — a negative IOD phase usually offers less. Both ENSO and IOD exert an offsetting impact on India's summer monsoon — while El Niño tends to lower this, a positive IOD increases rainfall. This year, ENSO is in a positive phase, so less rain was anticipated — however, the IOD is positive too. If that doesn't change, normal rain can be expected.

There are different types of ENSOs, based on spatial patterns of sea surface temperature (SST) around the tropical Pacific. One is dominated by variability around the East Pacific and termed Canonical ENSO or EP type. Another is dominated by variability around the Central Pacific (CP), called Modoki or CP type. A third is a combination,

termed Canonical-Modoki, all with different global and local influences.

The Indian summer monsoon (ISM)-ENSO teleconnection is strongly captured in the Central North East (CNE) India. The ISM represents a large-scale source of heat around the CNE region and the Inter-Tropical Convergence Zone (ITCZ) — this separates the northern hemisphere from the southern hemisphere — passes through here. This is also the meeting point of the east-west Walker and north-south Hadley air circulation.

A joint initiative among various groups working on global circulation models coordinated experiments comprising the 5th

phase of Coupled Model Inter-Comparison Project (CMIP5). I analysed the CMIP5 model output which captured the ISM-ENSO teleconnection — 80% of the models agree on the strength of the regional teleconnection around the CNE, suggesting the robustness of the ENSO teleconnection there. This is also present in improved predictions can empower millions who rely on monsoon rains.

Other factors can also shape the monsoon. In the last two decades of the 20th century, the ISM-ENSO teleconnection was disrupted. In my research, we found two powerful volcanic eruptions had taken place. The first was El Chichón in 1982, followed by Pinatubo in 1991. These occurred in phases of strong solar cycles and a domination of the Modoki ENSO. Researchers discussed a mechanism which could be triggered by explosive volcanoes via a preferential alignment of the North Atlantic Oscillation (NAO) or fluctuations of atmospheric pressure over this ocean. Strong volcanoes are often aligned with a positive NAO phase. Other features were also very distinct, including increases in Central Pacific warming, cooling in the North Atlantic and warming in the Eurasian sector. Both the NAO and Eurasian sector impact the N-S Hadley circulation. Thus, the strong teleconnection of the ISM and ENSO via the E-W Walker circulation was partly overtaken through a powerful N-S regional Hadley circulation — both the disruption and the subsequent recovery only emphasise the importance of the natural drivers of the Indian summer monsoon.



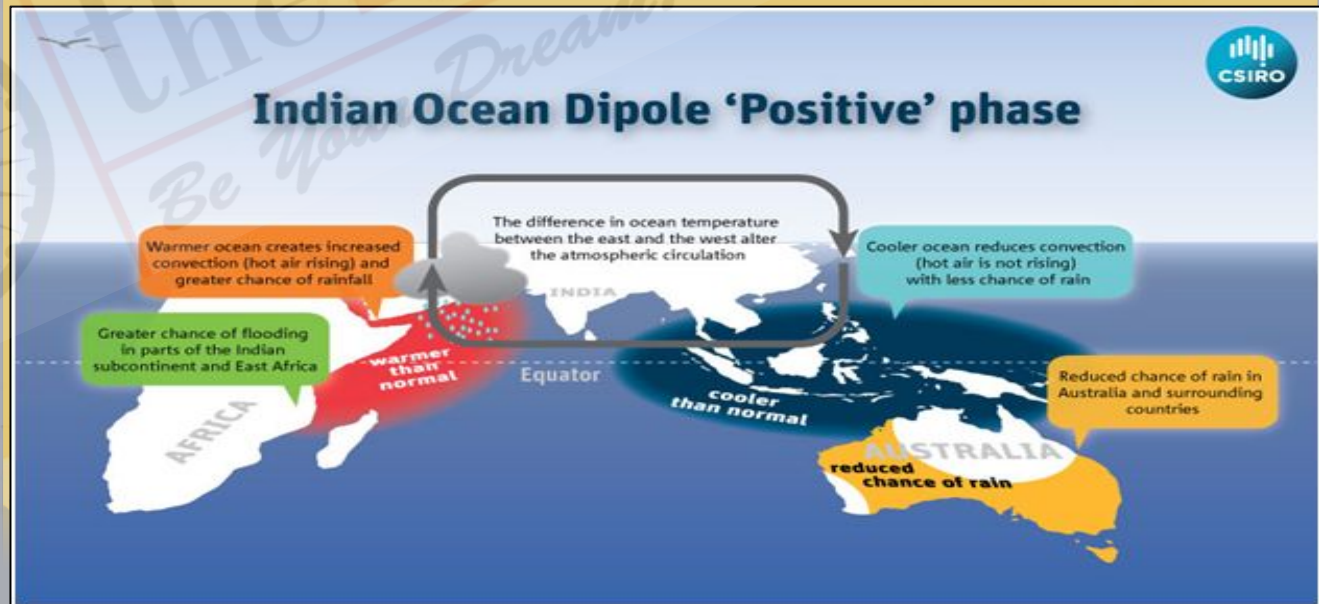
**HAPPY HARVESTS FOR ALL:** Monsoon science is vital in climatic change for those relying on rain-fed farming

### IN THE WINDS

**Context:** In 1999, a new mode in the Indian Ocean, termed the **Indian Ocean Dipole (IOD)**, was discovered which has a strong influence on the Indian summer monsoon.

### IOD and ENSO

- The IOD Index is **measured by differences in sea surface temperature** anomaly between the western equatorial and south-eastern equatorial portions of the Indian Ocean.
- During a **positive IOD phase**, India receives more rain - a negative IOD phase usually offers less.
- Both **El Niño-Southern Oscillation (ENSO) phenomenon** and IOD exert an offsetting impact on India's summer monsoon - while El Niño tends to lower this, a positive IOD increases rainfall.
- ENSO is the periodic variation of **sea surface temperatures (SST)** in east to central tropical Pacific which happens every two to three years.
- When the SST warms, there is a warm event ENSO phase. When it cools, it generates a cold event phase. The former is called **El Niño** and the latter **La Niña**.
- This year, **ENSO is in a positive phase**, so less rain was anticipated - however, the IOD is positive too. If that doesn't change, normal rain can be expected.



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