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सत्यमेव जयते



MK Yadav Sir

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BUSINESS STANDARD
Page 4

MISSION RAFTAAR

(Syllabus: GS Paper 3 - Economy & Infrastructure)

Railways' Mission Raftaar slows on speed restrictions

This comes despite ministry's aim of reducing curbs to raise average speed

DHRUVAKSH SAHA
New Delhi, 24 January

In the first half of financial year 2022-23 (H1FY23), the Ministry of Railways added over thrice the number of permanent speed restrictions than it got rid of, the national transporter's data shows. This comes even as the Indian Railways plans to roll out semi-high-speed and high-speed trains across the country.

While the Railways has aimed to reduce sectional temporary and permanent speed restrictions, in H1, zonal authorities added 653 new restrictions and removed just 184. At present, there are over 7,000 restrictions on the network.

Permanent speed restrictions are typically imposed in areas approaching sharp curves or crossovers, or those with structures close to the track or dense pedestrian traffic in the area. Level crossings are also a major cause of these restrictions, although the railways has eliminated most of such crossings on its broad-gauge network. There are also ecological factors involved such as unstable trackbeds and flooding possibility. Areas prone to frequent cattle hits may also see this restrictions.

The issue has gained prominence as the national transporter is looking to introduce Vande Bharat trains that can reach speeds of 220 kilometres per hour (kmph). However, even with the increased speeds, experts worry that these trains may remain on the slow track due to unnecessary speed restrictions.



At present, the fastest Vande Bharat train runs along the Delhi-Varanasi route, and has an average speed of 95 kmph. As the Centre looks to expand this service to the entire rail network, it is looking to raise major sectional speeds to a minimum of 110 kmph and optimally to 130 kmph.

"Speeds of 160 kmph for Vande Bharat will not be possible before adequate fencing infrastructure is in place," a senior Railways official said. The ministry is looking to place boundary walls across vulnerable stretches on the Delhi-Mumbai and Delhi-Howrah routes.

Sources in the Railways said the issue was brought up by top officials of the railway board and the ministry had begun a critical review of all restrictions imposed this financial year. Officials have also been told to expedite the removal of these restrictions.

The national transporter has reportedly deferred the deadline for meeting the targets set out under the Mission Raftaar by two years. Under the plan, the ministry aims to increase the average speed of mail and express trains to 75 kmph and freight trains to 50 kmph. As of October, the average speed of freight trains was 16 per cent higher than last year. According to ministry estimates, the average speed of freight trains is close to 19 kmph, including yarding and stabling time.

Context: In the first half of financial year 202223 (H1FY23), the Ministry of Railways added over thrice the number of permanent speed restrictions than it got rid of, the national transporter's data shows.

- The national transporter has reportedly deferred the deadline for meeting the targets set out under the **Mission Raftaar** by two years.

Mission Raftaar

- **About**: Mission Raftaar is an Indian Railway's project, to **increase the speed of trains** on busy routes, to reduce travel time.
- **Origin**: It was introduced in the **Railway Budget of 2016-17** and approved by NITI Aayog in 2017.
- **Nodal Ministry**: Ministry of railways.
- **Objectives**: It aims to **offer semi-high speed trains to passengers**, by running trains at a speed of 160-200 km/h in the selected corridors of the country.
- **Features**: The Railways has **chosen nine such corridors**, which carry 58 percent of freight and 52 percent of passenger traffic with a share of only 15 percent of total Rail Network.
    - **Busiest Routes chosen are:** Delhi – Mumbai, Delhi – Howrah, Howrah- Chennai, Chennai – Mumbai, Delhi – Chennai and Howrah – Mumbai.

ECONOMIC TIMES

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COAL GASIFICATION

(Syllabus: GS Paper 3 - Economy & Infrastructure)

Policy in Works to Draw Pvt Sector into Coal Gasification

Likely to be ready in 2 months, policy to offer capital subsidy, tax sops, assured coal availability

Shilpa.Samant@timesgroup.com



New Delhi: The coal ministry is planning a policy framework to incentivise private sector companies for developing coal-gasification projects The policy, aimed at providing capital subsidy, tax exemption and assured availability of coal, could be ready in two months, a senior government official told **ET**.

While the current coal production in India is somewhat in line with demand, it is expected that with the augmented production at commercial coal mines, the supply of the fuel will increase in the next couple of years.

"As the production increases, surplus will come, which will go to coal-to-chemical initiatives. So, it is an advance preparation," the official said.

Coal gasification is a process through which coal is broken down into its chemical constituents. The desired resultant products can be synthetic natural gas, dimethyl ether and ammonium nitrate.

Synthetic natural gas can be used as a substitute for LPG and for electricity generation, while dimethyl ether is an alternative to be used in diesel engines.

The government had launched a mission document for coal gasification of 100 million metric tonnes by 2030 since it is considered a cleaner option compared to burning of the fuel.

The total mines auctioned for commercial sale of coal, under various stages of development, have a total production capacity of 600 million metric tonnes a year.

Currently, the production from the operational commercial coal mines is around 100 million metric tonnes, the official said.

The production is expected to improve to 160 million metric tonnes in the financial year 2023-24 and 250 million metric tonnes in FY25, he added.

India has a reserve of 307 billion metric tonnes of thermal coal. About 80% of coal produced is used in thermal power plants.

Last year, the power sector saw a coal supply crisis in peak demand of April and May. Much of it was attributed to logistical issues in the wake of sudden demand increase.

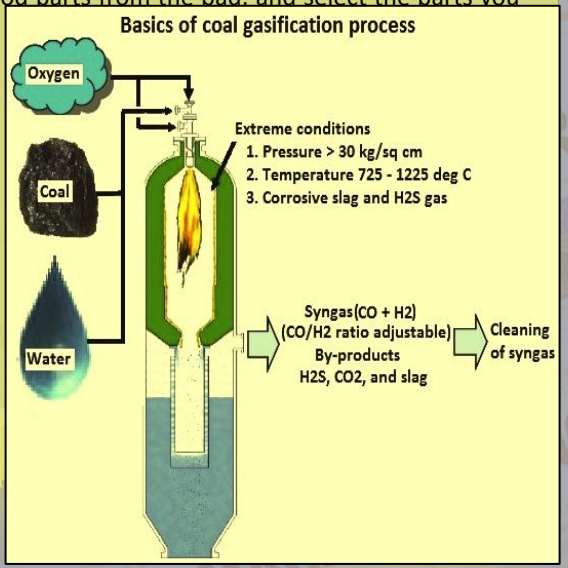
Despite increasing domestic coal-based power demand, the coal ministry expects surplus inventories that can be used for coal gasification in a couple of years.

Some coal-gasification projects are already being implemented on a pilot basis by government-owned Coal India Ltd.

Context: The coal ministry is planning a policy framework to incentivise private sector companies for developing **coal-gasification projects.**

Coal gasification

- **About**: Coal gasification is the **process of producing syngas**: a mixture consisting primarily of carbon monoxide (CO), hydrogen (H2), carbon dioxide (CO2), methane (CH4), and water vapour (H2O) - from coal and water, air and/or oxygen.
  - Rather than burning coal directly, **gasification converts all of the carbon of the coal into electricity**, hydrogen, and other forms of energy through partial oxidation.
- **Advantages**:
  - Coal gasification can help **address local pollution** problems that have in recent months brought parts of the country to a virtual standstill.
  - Gasification facilitates **utilisation of the chemical properties of coal.**
  - It is considered a **cleaner option** compared to the burning of coal.
  - Coal gas can be **converted into chemical energy** and is used for the production of iron from iron ore, as well as for the production of methanol and urea.
  - **Carbon Capture and Storage**: another advantage of coal gasification is the fact that it lets you separate the good parts from the bad, and select the parts you want to keep.
- **Disadvantages:**
  - Some studies say that coal gasification actually **produces more CO2 than a traditional coal plant.**
  - Its overall **carbon intensity is worse**: so it is not attractive at all from a climate change point of view.
  - Coal gasification is one of the **more water-intensive forms** of energy production while the country is already suffering from water shortages.



LIVE MINT

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NOMINAL AND REAL GDP

(Syllabus: GS Paper 3 - Economy)

India may peg nominal GDP growth at about 11% in budget

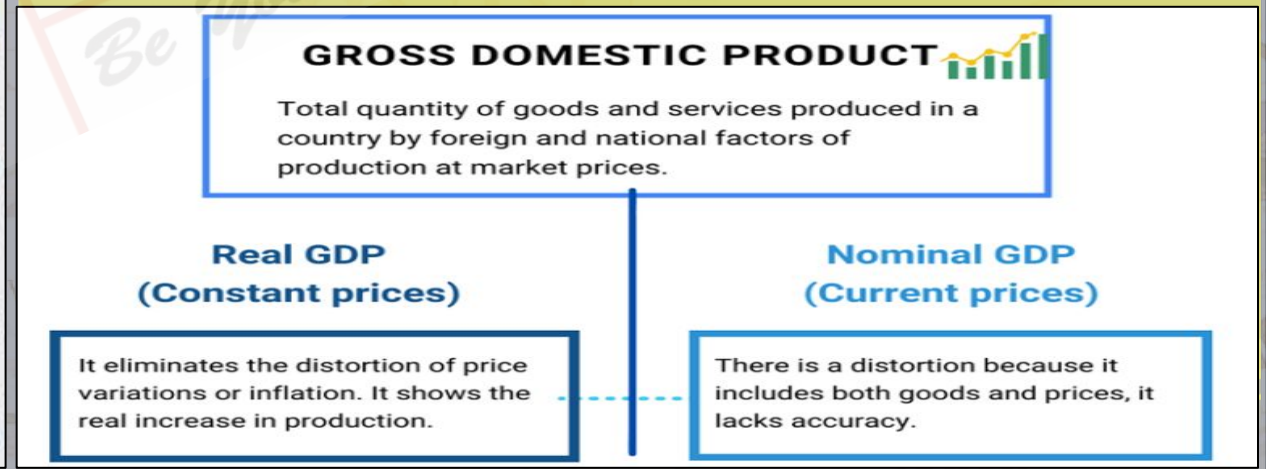


New Delhi: India is likely to peg its nominal gross domestic product (GDP) growth at around 11% in the annual budget next week, marking a slowdown from its estimate for the current fiscal year due to the prospect of weak exports, two government officials said. Nominal GDP growth—which includes inflation and is the benchmark used to estimate tax collections—could be pressured by suppressed external demand next year due to a likely US recession, said the sources. **REUTERS**

Context: India is likely to peg its **nominal gross domestic product (GDP)** growth at around 11% in the annual budget next week, marking a slowdown from its estimate for the current fiscal year due to the prospect of weak exports.

Nominal and Real GDP

- **Nominal GDP**: Nominal gross domestic product is GDP that is **evaluated at the present market prices.**
  - GDP is the **financial equivalent** of all the complete products and services generated within a nation in a definite time.
  - The **nominal varies from the real and incorporates changes** in cost prices due to an increase in the complete cost price. Generally, economists utilise a gross domestic factor to change the nominal GDP to the real GDP, which is also known as current dollar GDP or chained dollar GDP.
- **Real GDP**: It is an **inflation-adjusted calculation** that analyses the rate of all commodities and services manufactured in a country for a **fixed year.**
  - It is expressed in **foundation year prices** and referred to as a fixed cost price.
  - It is also known as **inflation-corrected GDP or constant price GDP.**
  - The real GDP is regarded as a **reliable indicator of a nation's economic growth** as it solely considers production and is free from currency fluctuations.



THE HINDU Page 4

Mass mortality of Olive Ridley turtles in A.P. raises concerns

T. Appala Naidu
SAKHINETIPALLI

Hundreds of vulnerable Olive Ridley turtles (*Lepidochelys olivacea*) have washed ashore along the coastline between Kakinada and Antarvedi in the Godavari region of Andhra Pradesh during the ongoing annual breeding season on the east coast.

The breeding grounds – Sakhinetipalli, Malikipuram, Mamidikuduru and Allavaram – have been witnessing the mass mortality of the turtles over the past few weeks.

The effluents being released from the aqua ponds along the coastline and the discharges from the pipelines of the onshore oil exploration facilities are blamed for the mass mortality of the turtles.

Since early January, a group of locals have photographed as many as 70 Olive Ridley turtles that have been found dead in their breeding grounds between Kakinada and Antarvedi.

Environmental activist Venkatipathiraja Yenumala, in a complaint to the Ministry of Environment, Forest and Climate Change, the AP Forest Department and the Pollution Control Board, said, "There is mass mortality of Olive Ridley turtles in the Mandals of Sakhinetipalli, Malikipuram, Mamidikuduru and Allavaram in the Konaseema region, where treated water is being discharged into the sea through pipelines by the oil exploration units, including ONGC facilities."



Sad end: Carcass of Olive Ridley turtle on the coastline of Konaseema district in Andhra Pradesh. SPECIAL ARRANGEMENT

In 2021, Mr. Venkatipathiraja waged a legal battle against the marine and groundwater pollution in the Konaseema region in the National Green Tribunal.

"The waste water from the aqua ponds is also being released into the sea and it is suspected to be one of the reasons for the mortality of turtles," Mr. Venkatipathiraja told *The Hindu*.

Responding on the issue, Dr. B.R. Ambedkar Konaseema District Forest Officer M.V. Prasada Rao said, "We have launched a probe into the mortality of Olive Ridley turtles in our district. A report is expected to be prepared on the reasons for the mortality."

On the other hand, the Forest Department has set up rookeries at Vakalatippa, S. Yanam, Gacchakayalapora and Sacremento Island. By January 24, as many as 2,352 eggs have been collected for conservation and safe breeding at the four rookeries.

OLIVE RIDLEY TURTLES

(Syllabus: GS Paper 3 - Env & Eco)

Context: Hundreds of vulnerable **Olive Ridley Turtles (Lepidochelys olivacea)** have washed ashore along the coastline between Kakinada and Antarvedi in the Godavari region during the ongoing annual breeding season on the east coast.

- The breeding grounds - Sakhinetipalli, Malikipuram, Mamidikuduru and Allavaram - have been witnessing the mass mortality of the turtles over the past few weeks.

Olive Ridley turtles

- **About**: **Smallest and most abundant** of all sea turtles found in the world. They get their name from their **olive colored carapace**.
- **Distribution and Habitat:** Found in **warm waters of the Pacific, Atlantic and Indian oceans.**
  - **India**: The **Odisha's Gahirmatha Marine Sanctuary** is known as the world's largest colony of breeding animals (rookery) of sea turtles.
    - They are found from the G**ujarat coast to the Andamans and Lakshadweep to Odisha and Bengal**.
- **Key features: Arribada**, unique mass nesting, where thousands of females come together on the same beach to lay eggs.
  - **100 to 140 eggs** are laid by the adult female turtle at a time.
  - The males and females olive ridley turtles grow the same in size.
- **Largest Mass Nesting Site**: Odisha Coast.
  - Three river mouths where the turtles come together for mass nesting: Dhamra River, Rushikulya River and Devi River.
- **Feeding habits:** They are carnivorous species, and they eat mainly jellyfish, shrimp, snails, crabs, molluscs and a variety of fish and their eggs.
- **Threats**: Human Consumption, Plastic Garbage, Fishing Trawlers and Pollution.
- **Protection Status:**
  - **Wildlife Protection Act, 1972**: Scheduled 1
  - **IUCN Red List**: Vulnerable
  - **CITES**: Appendix I
  - **Convention on Migratory Species (CMS) (Bonn Convention)**: Listed in the convention.
- **Conservations efforts:**
  - **Operation Olivia**: A project carried out by the Indian Coast Guard to protect the population of Olive Ridley turtles during their nesting seasons from December to May.
  - **Turtle Excluder Devices (TEDs)**: These are 2-D net inserts that have large escape openings for turtles. These are compulsory to be used by the trawlers while shrimp fishing.
  - **Odisha Government Initiatives**: To protect the nesting and breeding habitat of Olive Ridley Turtles, the waters around Bhitarkanika were declared as Gahirmatha (Marine) Wildlife Sanctuary in September 1997.

DTE JAN 25

CONGO RAINFOREST

(Syllabus: GS Paper 3 - Env & Eco)

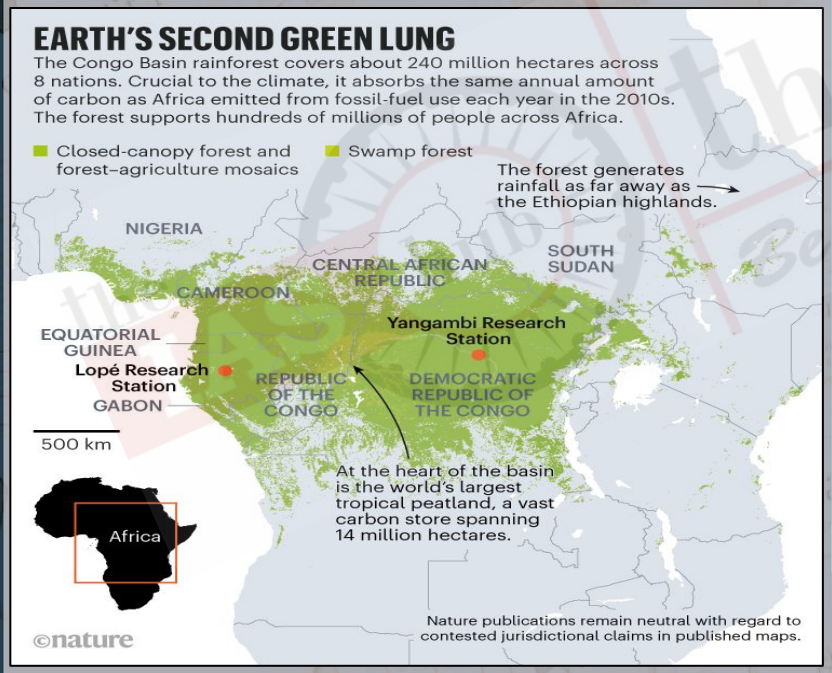
Save Africa's forest elephants if you want the Congo rainforest to continue capturing carbon: Study

World's second-biggest rainforest could lose 6-9 % of its carbon capture ability, if the forest elephant goes extinct, says Saint Louis University research

NEXT NEWS >

By Rajat Ghai
Published: Tuesday 24 January 2023





Context: World's second-biggest rainforest, **Congo rainforest**, could lose 6-9 % of its carbon capture ability, if the forest elephant goes extinct, says Saint Louis University research.

Key Points

- While the '**African elephant'** usually conjures images of the species found on the savannas of the Continent (Loxodonta africana), it is its smaller cousin found in the world's second-biggest rainforest that holds the keys to global carbon sequestration. That would go awry if the species bows out.
- They are listed by the **International Union for Conservation of Nature as "Critically Endangered**" - a category for species that have declined over 80 per cent within three generations.
- The **African forest elephant (Loxodonta cyclotis)** plays a key role in creating forests which **store more atmospheric carbon and maintaining the biodiversity of forests in Africa.**
- These elephants acted as **'gardeners of the forest'**. Each forest has low carbon density and high carbon density trees. The former have light wood while the latter have heavy wood.
- Low carbon density trees grow quickly, rising above other plants and trees to get to the sunlight. Meanwhile, high carbon density trees grow slowly, needing 2/5 less sunlight and able to grow in shade.
- The African forest elephant **strips away the low carbon density trees.** This means that it removes the competitors of high carbon density trees. This also enables the sunlight to reach more high carbon density trees.
- The elephants also **spread the seeds of the high carbon density trees** across the forest through their droppings.

DTE JAN 25

SANKHYA SAGAR LAKE

(Syllabus: GS Paper 3 - Env & Eco)

Madhya Pradesh's newest Ramsar wetland covered in invasive water hyacinth, threatening biodiversity

No migratory birds visited Sankhya Sagar this winter; connecting lakes Jadhav Sagar and Madhav Sagar also covered in green layer

NEXT NEWS >

By Shuchita Jha
Published: Tuesday 24 January 2023





Context: An artificial lake, **Sankhya Sagar**, in Madhya Pradesh's Shivpuri district has virtually disappeared under a thick layer of an invasive aquatic plant, threatening the biodiversity of the water body.

Key Points

- The **Sankhya Sagar** was declared a **Ramsar site** in July 2022.
- The lake spreads across 248 hectares (612.82 acres) with a catchment of 37,522 ha and helps maintain the ecological balance of the **Madhav National Park.**
- As a Ramsar site, it is a wetland site designated internationally important by the **United Nations Educational, Scientific and Cultural Organization.**
- More than six months since the declaration of the lake as a Ramsar site, it is now covered in **water hyacinth (Pontederia crassipes),** an invasive species native to South Africa.
- The plant has **naturalised itself** in many other parts of the world.
- While the plant has some uses too, when it covers the entire surface of a water body, it **becomes a threat to aquatic biodiversity.**
- **Water hyacinth acts as a water purifier** by removing heavy metals from water when present in small quantities.
- The plant is a **prolific spreader** and when it covers the entire surface of a water body, it does not allow sunlight to penetrate the water and also starts depleting oxygen.
- Sankhya Sagar **supports significant populations of 19 indigenous fish species,** which spawn and breed in its habitat, according to the website for Ramsar wetlands. The water body has a mix of riverine and palustrine (marsh) habitat fish populations, making them critical to maintaining the overall biodiversity of the region.
- The fish species, in turn, support the population of **piscivorous (fish-eating) birds**. Waterfowls are also present here in large numbers. The lake is home to 73 species of birds and welcomes migratory birds during winter.
- The lake is also home to marsh crocodiles. **Marsh crocodile aka 'Mugger' (Crocodylus palustris)** is a Schedule I reptilian species protected under the Indian Wildlife (Protection) Act, 1972.
- The reptiles were introduced in **Jadhav Sagar** in 1987 by the Madras Crocodile Bank.

TIMES OF INDIA

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BHAROS

(Syllabus: GS Paper 3 - Sci & Tech)

India-made BharOS to take on Android, iOS

TIMES NEWS NETWORK

New Delhi: An Indian company with mentorship from IIT-Madras has come out with an indigenous mobile operating system — BharOS (short for Bharat OS) — that is poised to take on Google Android and Apple iOS with a more secure system.

The OS, launched by communications minister Ashwini Vaishnaw and education minister Dharmendra Pradhan, aims to enable private enterprises and companies to set up customised operating systems according to their needs. The move comes at a time when Google faces legal challenges in India over abuse of dominance and unfair practices in relation to its Android operating system. BharOS was developed by JandK Operations (JandKops), which has a 30-member team and has been incubated at the Indian Institute of Technology (IIT), Madras. "Tested Indian 'Operating System' — BharOS developed at IIT-Madras. A leap forward in PM Narendra Modi's Aatmanirbhar Bharat journey," Vaishnaw said in a tweet.



SHOWING BharOS-A: Union ministers Dharmendra Pradhan & Ashwini Vaishnaw tested the indigenous operating system in New Delhi on Tuesday

BharOS does not come with any default apps and gives users access to only trusted apps from private store services. Users are not forced to use apps that they may not be familiar with or that they may not trust. "This is a Linux-based OS," professor V Kamakoti, director of IIT-Madras said.

"We have a long way to go, but if this happens, monopoly by anybody will go away," Pradhan said at the BharOS testing event, without naming any companies. "Poor people of the country will be the main beneficiaries of a strong, indigenous, dependable and self-reliant digital infrastructure. BharOS is a successful step towards data privacy." The system can be installed on commercial off-the-shelf handsets. BharOS services are currently being provided to organisations that have stringent privacy and security requirements.

- **Access to PASS**: With BharOS, users get free access to PASS. **PASS means Private App Store Service.** PASS has a list of curated apps. Meaning the apps in PASS are of high standard and secure. They are already screened for malware, hacking issues, password protection, and other security features.
- **Drawback**: The drawback of default apps is **memory consumption**. If the user is not using these apps, they drain out user data, memory, and power.
- **Launched under NMICPS**: JandK launched the app under NMICPS, that is, **National Mission on Interdisciplinary Cyber-Physical Systems.**
    - It operates under the **DST of the Science and Technology ministry.**
    - NMICPS aims to provide **training in cyber technologies** and prepare youth to face challenges in the field.

Context: Union Education and Skill Development & Entrepreneurship Minister along with Minister for Railways, Communications, Electronics & Information Technology successfully tested the '**BharOS', a Made In India mobile operating system** developed by IIT Madras.

BharOS

- **About**: The BharOS is an **operating system** used in mobile phones.
- **Developed by**: **JandK Operations Private Limited**.
    - IIT Madras was the pioneer in developing the app and IIT Madras developed it through its JandK organization.
    - Basically, JandK is a non-profit private organization.
- **Funding**: It is funded by the **Science and Technology department** of the Government of India.
- **Key Features of BharOS:**
    - There are **No Default Apps in the OS**. Default apps are those applications that come with OS. The user cannot uninstall them.
        - For instance, Gmaps, GMAIL, and other Google Applications are the default apps of Android OS.
        - We cannot uninstall them even if we are not using them.
    - It provides **strict security features** and therefore is apt for 5G networks.
        - Users willing to use cloud services will be benefited the most from the app.
    - The OS provides **more control to the users.**
        - Applications get installed on the OS only after taking user permission.
        - This does not happen in Android and iOS.
    - The OS is unique as it allows **only safe and trusted applications** to be installed on the OS.
        - BharOS screens the applications before installation begins.
        - If the app is not safe, then the OS doesn't provide access.

INDIAN EXPRESS

Page 15

NOROVIRUS

(Syllabus: GS Paper 3 - Sci & Tech)

NOROVIRUS CASES IN KERALA: WHAT IS THIS VIRUS, HOW DANGEROUS IS IT

ANONNA DUTT
NEW DELHI, JANUARY 24

KERALA MONDAY confirmed two cases of the gastrointestinal infection norovirus in Class 1 students in Ernakulam district. The two samples were tested after 62 persons — students and their parents — developed symptoms such as diarrhoea, abdominal pain, vomiting, nausea, a high temperature, headache, and body aches.

What is norovirus?

Norovirus has been circulating among humans for over 50 years and is thought to be one of the primary causes of gastroenteritis. The virus is estimated to kill 200,000 persons globally every year, with most deaths occurring among those below the age of five years and those over the age of 65 years.

The virus is capable of surviving low temperatures, and outbreaks tend to be more common during the winter and in colder countries — that is why it is sometimes referred to as "winter vomiting disease".

What is the incidence of infection in India?

Cases of norovirus are not as common in India as in many other places — at the same time, the recent cases in Kerala are by no means unique or one-offs. The infection has been reported in previous years as well, mainly from southern India, and especially from Kerala.

Dr E Sreekumar, director of the Institute of Advanced Virology-Kerala, said that the reported cases of norovirus have been on the rise in recent years. "One of the reasons could well be that we were not looking for the virus previously. Now we have systems to detect not just this virus but several others."

Why is the infection common in Kerala?

It probably has more to do with Kerala's strengths than weaknesses. Dr Sreekumar said that the state has a strong public health system that is capable of picking up clusters of infection and getting them tested quickly.

Can it cause a large-scale outbreak?

No. Even though more cases of norovirus are being detected, experts say that this is unlikely to lead to a large-scale outbreak.

How to prevent its spread?

The infection can be transmitted through foods contaminated with the virus, touching surfaces that are contaminated with the virus and then touching the mouth, and being in direct contact with someone with the infection like taking care of them and sharing foods and utensils with them.

Also, food items should be carefully washed and cooked at high temperatures. The norovirus can survive temperatures as high as 60 degrees Celsius.

Good hand hygiene is the best way to prevent infection. Wash your hands with soap and water for 20 seconds. Hands sanitisers are thought to not work too well against norovirus.

As the infection can be transmitted by foods, it is suggested that a sick person not prepare food for others.

LONGER VERSION ON WWW.INDIANEXPRESS.COM

Context: The Kerala Health Department (January 24) confirmed two cases of the gastrointestinal infection norovirus in class 1 students in Ernakulam district.

Norovirus

- **About**: The virus is **capable of surviving low temperatures**, and outbreaks tend to be more common during the winter and in colder countries - that is why it is sometimes referred to as "**winter vomiting disease".**
- **Origin**: Norovirus is not new; it has been **circulating among humans for over 50 years** and is thought to be one of the primary causes of **gastroenteritis**.
    - Norovirus infections are **more frequently detected in high income countries,** with almost 40% cases being seen in long-term care facilities.
    - In contrast, the cases in India have mostly been detected in settings like **schools and hostels, where people share food.**
- **Symptoms**: Norovirus leads to **diarrhoea, vomiting, nausea, and abdominal pain**. Being a diarrhoeal disease, it can lead to **dehydration**, so drinking plenty of fluids is recommended.
- **Spread and Transmission**: The infection can be **transmitted through foods contaminated with the virus,** touching surfaces that are contaminated with the virus and then touching the mouth, and being in direct contact with someone with the infection like taking care of them and sharing foods and utensils with them.
- **Treatment**: **Good hand hygiene** is the best way to prevent infection. Wash your hands with soap and water for 20 seconds.
    - Hands sanitisers are thought to not work too well against norovirus.
    - As the infection can be transmitted by foods, it is suggested that **a sick person not prepare food for others.**
    - All food items should be carefully washed and **cooked at high temperatures.**
    - The norovirus **can survive temperatures as high as 60 degrees Celsius.**

PIB JAN 25

EXERCISE TROPEX-23

(Syllabus: GS Paper 3 - Internal Security)

THEATRE LEVEL OPERATIONAL READINESS EXERCISE (TROPEX-23) INDIAN NAVY'S LARGEST WAR GAME

Context: The 2023 edition of Indian Navy's major maritime exercise **TROPEX**, is currently underway in the Indian Ocean Region.

Key Points

- This operational level exercise is **conducted biennially** and witnesses participation not only by all Indian Navy units but also of Indian Army, Indian Air Force and Coast Guard assets.
- **TROPEX 23** is being conducted over a **duration of three months** from Jan - Mar 23.
- Conduct of TROPEX is being **overseen by Naval Headquarters** with participation from all three Commands of the Indian Navy (Eastern, Western and Southern Naval Command) and the only Tri-Service theatre command of the Indian Armed Forces located at Port Blair.
- As part of the exercise, **all surface combatants of the Indian Navy** including Destroyers, Frigates, Corvettes as well as submarines and aircraft are put through complex maritime operational deployments to validate and refine the Navy's Concept of Operations including operational logistics and interoperability with other Services.
- The exercise is being conducted in different phases, **both in harbour and at sea,** encompassing various facets of combat operations, including live weapon firings.
- Having grown in scope and complexity over the years, this exercise provides an **opportunity to test the combat readiness of the combined Fleets of the Indian Navy** to operate in a multi-threat environment.
- The maritime exercise also **facilitates operational level interaction** with the Indian Army, Indian Air Force and the Coast Guard, which will further strengthen interoperability and joint operations in a complex environment.

PIB JAN 25

EXERCISE AMPHEX

(Syllabus: GS Paper 3 - Internal Security)

Tri-services Amphibious Exercise, AMPHEX 2023 Concludes

Context: The **biennial Tri-Services Amphibious Exercise, AMPHEX 2023** was conducted at Kakinada, Andhra Pradesh from 17 to 22 January 23.

Key Points

- AMPHEX is aimed at **joint training of elements of all three services** in various facets of amphibious operations to enhance interoperability and synergy.
- AMPHEX 23 is the first time that the exercise was undertaken at **Kakinada**, and was the largest ever AMPHEX conducted till date.
- The participating forces **undertook complex exercises** in all domains of amphibious operations over five days.
- The exercise witnessed the participation of a number of amphibious ships consisting of **Large Platform Dock (LPD), Landing Ships and Landing Crafts, Marine Commandos (MARCOS),** helicopters and aircraft from the Indian Navy.
- Indian Army participated in the exercise with over 900 troops which included **Special Forces, Artillery and Armoured vehicles. Jaguar fighters and C 130 aircraft** from the IAF also participated in the exercise.
- AMPHEX 2023 successfully **demonstrated the amphibious capabilities** and validated the excellent coordination that exists between the three Services to undertake the full spectrum of amphibious operations.

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