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MINISTRY OF SCIENCE AND TECHNOLOGY



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PIB

Jan 3

KLI-SOFC
(Syllabus: GS Paper 3 - Economy)

PM inaugurates Kochi-Lakshadweep Islands Submarine Optical Fibre Connection

Context: Recently, the Prime Minister of India inaugurated the Kochi-Lakshadweep Islands Submarine Optical Fiber Connection (KLI-SOFC) project in Kavaratti, Lakshadweep.

Kochi-Lakshadweep Islands Submarine Optical Fiber Connection (KLI-SOFC)

- **Aim**: To enhance internet speed, opening up new possibilities and opportunities for the Lakshadweep Islands.
- **Communication Infrastructure**: The dedicated submarine OFC ensures a paradigm shift in Lakshadweep's communication infrastructure, enabling faster and more reliable internet services.
- **Submarine Cable Connectivity**: Under the KLI project, submarine cable connectivity has been extended from the mainland (Kochi) to eleven Lakshadweep Islands, including Kavaratti, Agatti, Amini, Kadmat, Chetlet, Kalpeni, Minicoy, Androth, Kiltan, Bangaram, and Bitra.
- **Benefit of the KLI Project**
  - The project will play a significant role in achieving the objective of 'Digital India' and 'National Broadband Mission' and in rolling out of various e-governance projects of the Government of India in Lakshadweep Islands.
  - E-Governance, Tourism, Education, Health, Commerce, and Industries will get a boost.
  - The population of Lakshadweep Islands will be provided high-speed wireline broadband connectivity.
  - High-speed broadband will be provided through FTTH and 5G/4G Mobile networks.
  - The bandwidth created under this project will be available to all Telecom Service Providers (TSPs) to strengthen their telecom services in the Lakshadweep Islands.

THE HINDU

Page 1

SC VERDICT ON HINDENBURG ISSUE

Syllabus GS Paper 3 – Economy)



SC upholds SEBI probe, turns the spotlight on Hindenburg's 'conduct'

Krishnadas Rajagopal
NEW DELHI

The Supreme Court on Wednesday trained the spotlight on the "conduct" of Hindenburg Research, directing the Securities and Exchange Board of India (SEBI) and investigating agencies of the Centre to probe and, if necessary, take "suitable action" if the losses suffered by Indian investors due to the short position taken by the U.S.-based firm in the Adani Group through U.S.-traded bonds and non-Indian traded derivative instruments involved any infraction of law.

The direction came in a 46-page judgment based on petitions claiming "precipitate decline" in investor wealth and volatility in the share market due to a fall in the share prices of the Adani Group following a report published by "activist short seller" Hindenburg Research on January 24, 2023.

The report had alleged that the Adani Group manipulated its share prices and failed to disclose transactions with related parties in violation of the regulations framed by the SEBI and securities' laws.

However, even as it directed the SEBI and probe agencies to open an inquiry into Hindenburg and "other entities", a three-judge Bench headed by Chief Justice of India D.Y. Chandrachud noted that the volatility in Adani stocks in the aftermath of the Hindenburg report had an impact only at an individual scale and did not result in market volatility.

"According to the Expert Committee [Justice A.M. Sapre Committee], the trend observed in volatility in the Indian market in comparison with the global volatility index has been consistent since the COVID-19 pandemic and was maintained even during the period when volatility was observed in the Adani stocks," Chief Justice Chandrachud noted.

CONTINUED ON » PAGE 10

Relief for regulator

Key takeaways from the SC judgment in Adani-Hindenburg case:

- SEBI directed to investigate if the short position taken by Hindenburg amounted to any infraction of law
- Judiciary's review of regulatory framework/policies of SEBI is limited to check if there is any manifest arbitrariness or violation of fundamental rights
- SEBI probe is comprehensive; it has completed 22 out of 24 investigations against Adani Group
- The threshold to transfer investigation from SEBI to another agency is not present
- Petitioners did not verify the OCCRP findings; it cannot be used as conclusive proof or credible evidence against a statutory regulator
- Allegations of conflict of interest against members of the Justice A.M. Sapre Committee are dismissed

Third party reports not conclusive proof: SC

The Hindu Bureau
NEW DELHI

The three-judge Bench of the Supreme Court on Wednesday said investigative news pieces and reports by independent groups cannot be used by petitioners in court as conclusive proof of the inadequacy of an investigation by a specialised regulator.

FULL REPORT » PAGE 11

Context: The Supreme Court recently directed SEBI and investigating agencies to probe Hindenburg Research's conduct in the Adani Group's case, emphasizing potential legal violations and urging suitable action for losses suffered by Indian investors.

Adani-Hindenburg Issue

- Hindenburg Research **has alleged that the Adani Group was "engaged in a stock manipulation** and accounting fraud".
- The Adani Group has **interests in varied sectors such as ports and logistics**, power generation, agribusiness, real estate, defence, solar energy, financial services, natural resources, and media.
- The **research firm alleges that the Adani group has engaged in ₹17.8 trillion** (US$ 218 billion) brazen stock manipulation and accounting fraud schemes over the course of decades.

Securities and Exchange Board of India (SEBI)

- **Establishment**: As a statutory body in the year 1992.
- **Headquarters**: Mumbai, Maharashtra
- **Ministry**: Ministry of Finance
- **Aim:** To protect the interests of investors in securities and to promote the development of, and regulate the securities market.
- **Power and Functions**
  - The **Securities Laws (Amendment) Act, 2014 empowers SEBI** to oversee money pooling arrangements exceeding Rs. 100 crore, allowing the authority to seize assets in cases of noncompliance.
  - The **SEBI Chairman holds the authority to authorize** "search and seizure operations," and the SEBI board can request information, including telephone call data records, related to securities transactions under investigation.
  - **SEBI is entrusted with the registration and regulation of venture capital funds** and collective investment plans, which include mutual funds.
  - **SEBI's mandate extends to promoting and regulating self-regulatory bodies** while also striving to eliminate fraudulent and unfair trading activities in the securities markets.

NEW INDIAN EXPRESS

Jan 3

DAMPARA WILDLIFE SANCTUARY

(Syllabus: GS Paper 1 – Env and Eco)

Forest department in Odisha plans nocturnal trail in -Dampara Wildlife Sanctuary

Context: As a first, the Forest Department in Odisha has planned a 'nocturnal trail' for people, especially students and researchers, in the Chandaka-Dampara Wildlife Sanctuary.

Chandaka-Dampara Wildlife Sanctuary

- **Location**: Cuttack Districts of Odisha State, close to the state capital, Bhubaneswar. Nestled in the Khordha uplands of the 'North-Eastern Ghats' biotic region.
- **Geography and Size**: Covering 193.39 sq.km of rolling table land and small sprawling hillocks.
- This area has been designated as a wildlife sanctuary since August 1982.
- **Wildlife Conservation**: Known for the successful conservation of elephants, which is the principal species thriving in this sanctuary.
- **Vegetation**: The floral diversity within the sanctuary spans six types, including secondary moist miscellaneous semi-evergreen forests, moist Kangada (Xyliaxylocarpa) forests, Coastal Sal forests, thorny bamboo brakes, planted Teak, and Eupatorium scrub.
- **Reservoirs**: Two water reservoirs, namely Deras Dam and Jhumka Dam, are situated within the sanctuary.
- **Flora:** Kochila, Kalicha, Belo, Kangada, Giringa, Sunari, Sal, Kumbhi, Jamu, Karanja, Teak, and Sidha.
- **Fauna:** Leopard, Chital, Barking deer, Mouse deer, Wild pig, Common langur, Rhesus monkey, small Indian civet, etc.

DTE Jan 3

MICROPLASTICS
(Syllabus: GS Paper 3 – Env and Eco)

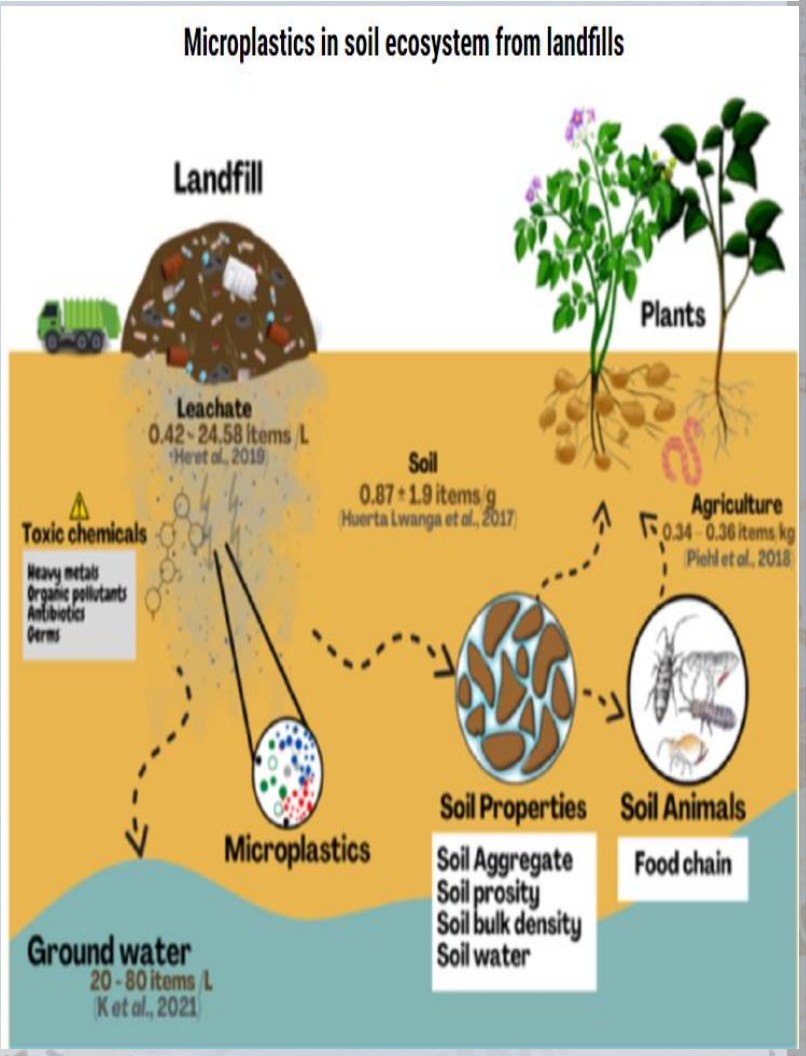
Indian landfills — a source of microplastics?

Context: Scientific landfills are considered containment systems that isolate waste from the surrounding environment.

Microplastics

- **About**: Microplastics are minute fragments of diverse plastic materials present in the surroundings.
- These **minute plastic particles pose a threat to marine environments** and the creatures that inhabit them.
- **A recent study revealed** a groundbreaking discovery: microplastics, which are minuscule plastic particles, have been identified in human blood for the very first time.
- **Two main categories of Microplastics**
  - **Primary Microplastics:** These are released into the environment from a variety of sources.
  - **Secondary Microplastics**: These are created when larger plastics break down.

Microbeads: A type of microplastic, are very tiny pieces of manufactured polyethylene plastic that are added as exfoliants to health and beauty products, such as some cleansers and toothpaste.



LIVEMINT

Page 2

LI-ION BATTERY

(Syllabus: GS Paper 3 – Sci and Tech)

'India should weigh lithium-ion options for e-mobility'

Sood specifically mentioned sodium-ion and aluminium air batteries as alternatives to lithium

Gireesh Chandra Prasad, Rituraj Baruah & Alisha Sachdev

NEW DELHI

India should explore alternatives to lithium-ion batteries for scaling up electric mobility, the government's principal scientific advisor Ajay Kumar Sood said, amid a global scramble for critical minerals.

Sood, who also chairs the Prime Minister's Science, Technology, and Innovation Advisory Council specifically mentioned sodium-ion and aluminium air batteries as alternatives to lithium. Mining lithium is yet to take off in India although reserves found in Jammu and Kashmir and Rajasthan make India among the top 10 holders of the mineral.

Sood said that although efforts are underway in India for making lithium-ion batteries, these are only produced in a small scale, meriting a search for alternatives.

"The question is, can we do sodium-ion technology on a commercial scale? That is the goal because lithium is less abundant. It's not something India will have for a long time. Instead of lithium-ion battery for electric mobility, can we go for sodium-ion battery and aluminium air battery which entails a (battery) swapping kind of mechanism. Can we adopt these for our electric vehicles?" said Sood.

Aluminium air batteries are not recharged with external power, but the aluminium plates used as anode are replaced once fully used—spelling further logistical challenges.

Sood said some of the sodium-ion battery technologies developed indigenously by private firms and CSIR can be used for commercial-scale production.

"Everyone is trying to improve. You don't see sodium-ion batteries in vehicles now. But they will come because they will be cheaper as sodium is available in plenty. This is what we should do. This is what India has to think," said Sood.

As per information available from the science and technology department, the government supports 32 research projects in battery storage which have led to several prototypes, including sodium-ion battery packs and accessories developed by IIT Bhubaneswar and Kharagpur.

Experts say challenges in developing alternatives to lithium-ion batteries include high production costs, the need for significant continued investments and tackling production bottlenecks.

"The biggest challenge for emerging solutions such as sodium-ion or aluminium air batteries is how quickly their manufacturing cost can be brought down to a level where they can be integrated into the electric mobility ecosystem," said Rajat Verma, founder and chief executive officer of Lohum Cleantech Pvt Ltd, an integrated lithium-ion battery manufacturer and recycler.

According to Prajwal Sabnis, co-founder, Orxa Energies, a Bengaluru-based company that builds performance electric motorcycles, India will need meaningful investments in research and development, strategic tie-ups for global knowledge exchange and talent development.

Sabnis said a few companies are working on both sodium chemistry and aluminium air chemistry but work in this space is at a relatively early stage and production limited to lab-scale.

"Scaling up production requires tackling manufacturing bottlenecks such as equipment setup and commissioning," said Sabnis.

For the moment, said Lohum's Verma, industry representatives see a clear advantage for lithium-ion batteries over others. "We appreciate the sentiments around exploring alternative battery solutions but we believe that India can become a global leader in lithium-ion batteries as technology only keeps getting refined."

Verma said the cost of producing lithium-ion batteries has come down from $1,000 per kilowatt hour in 2010 to about $100 per kilowatt hour.

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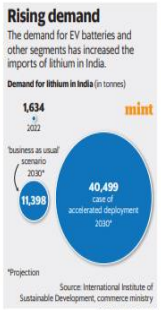


Ajay Kumar Sood, principal scientific advisor to the government.

Rising demand

The demand for EV batteries and other segments has increased the imports of lithium in India.

Demand for lithium in India (in tonnes)



*Projection

Source: International Institute of Sustainable Development, commerce ministry

SATISH KUMAR/MINT

$100 per KW hour is the cost of readying lithium-ion batteries

32 battery storage research projects supported by govt

Context: India should explore alternatives to lithium-ion batteries for scaling up electric mobility, the government's principal scientific advisor said, amid a global scramble for critical minerals.

Li-ion Battery

- **Type:** rechargeable battery.
- **Battery Structure:** Electrolyte and Electrodes in Li-Ion Batteries
- **The government's plan** to make India a 100% EV nation by 2030 includes a focus on the production of lithium-ion cells.
- **The Nobel Prize in Chemistry for 2019** was collectively granted to **John B. Goodenough, M.M Stanley Whittingham, and Akira Yoshino** in recognition of their contributions to the advancement of lithium-ion batteries.
- **Applications:** Electronic gadgets, Electric Vehicle, Tele-communication, Aerospace, Industrial applications

Lithium

- **Also Known as**: White Gold
- It is a **soft and shiny grey metal**, that is present in the Earth's crust.
- It's an extremely reactive and **alkaline element.**
- **Primarily utilized in** ceramics, glasses, greases, pharmaceuticals, air conditioners, and aluminium production.
- **Major Global Lithium Reserves:** Chile > Australia > Argentina are the top countries with Li reserves.
- **Lithium Triangle:** Chile, Argentina, Bolivia.
- **Lithium Reserves in India:** Karnataka, Rajasthan, Odisha, Gujrat & Andhra Pradesh.

LANCET REPORT ON CANCER
(Syllabus: GS Paper 2 – Health)

India had the second highest number of cancer deaths in Asia in 2019: Lancet

Context: India ranked second in terms of cancer burden in Asia in 2019. The country recorded 1.2 million new cases and 929,600 deaths, according to a study published by The Lancet Regional Health Southeast Asia journal.

Highlights of the Study

- China had the highest cancer burden in the continent in 2019 — 4.8 million new cases and 2.7 million deaths.
- Japan ranked third with 887,300 new cases and 437,700 deaths.
- Overall, cancer seems to be a major public health threat in Asia.
- **Top Five Cancers in most Asian Countries**: Tracheal, bronchus, and lung cancer (both sexes), breast cancer (among females), colon and rectum cancer (both sexes), stomach cancer (both sexes), and prostate cancer (among males) were among.
- **According to the Study**: The high prevalence of smokeless tobacco such as khaini, gutkha, betel quid, and paan masala is a public health concern in South Asian countries such as India, Bangladesh, and Nepal.

Steps Taken by India to Control Tobacco Consumption

- **India adopted the tobacco control provisions** under WHO Framework Convention on Tobacco Control (WHO FCTC).
- The **Promulgation of the Prohibition of Electronic Cigarettes Ordinance, 2019 prohibits Production, Manufacture**, Import, Export, Transport, Sale, Distribution, Storage and Advertisement of e-Cigarettes.
- The Government of **India launched the National Tobacco Quitline Services** (NTQLS) which have the sole objective to provide telephone-based information, advice, support, and referrals for tobacco cessation.
- **mCessation Programme is a similar initiative which uses mobile technology for tobacco cessation**. It was launched in 2016 as part of the government's Digital India initiative.

INDIAN EXPRESS

Page 1

BUXA TIGER RESERVE
(Syllabus: GS Paper 3 – Env and Eco)



Tiger zinda hai: Big cat's return brings hope in Bengal reserve

RAVIK BHATTACHARYA
KOLKATA, JANUARY 3

TWO YEARS ago, a fleeting glimpse of a tiger gave way to disappointment in West Bengal's Buxa National Park, as the big cat was not to be seen again.

Then, on December 28, forest officials got an early New Year's gift as one of the camera traps in the national park captured a tiger crossing a dry riverbed. And three days later, on December 31, the tiger was captured at night, on a different camera.

The previous sighting, on December 12, 2021, was after 23 years of the big cat going missing from the tiger reserve. Experts are now hopeful that the tiger has returned for good, and what could follow is relocation of villages from inside the core area.

Experts say an increase in its

CONTINUED ON PAGE 2

Caught on camera trap on December 28

KUNO CHEETAH GIVES BIRTH TO THREE CUBS

PAGE 6

BUXA TIGER RESERVE
BHUTAN
TIGER RESERVE ENTRY POINT
Alipurduar
Kaljani river
INDIA
West Bengal
Assam



Context: Two years ago, a fleeting glimpse of a tiger gave way to disappointment in West Bengal's Buxa National Park, as the big cat was not to be seen again.

Buxa Tiger Reserve

- **Location**: BTR is located in the Alipurduar district of West Bengal.
- **Establishment**: In 1983, Buxa Tiger Reserve holds the distinction of being the 15th tiger reserve in India.
- **Boundaries**: BTR's northern boundary aligns with the international border with Bhutan.
  - The Sinchula hill range extends along the northern side, while the eastern boundary touches that of Assam.
- **Biodiversity**: It represents the highly endemic Indo-Malayan region.
  - The fragile "Terai Ecosystem" is an integral part of this reserve.
- **International Boundaries**: The Phibsoo Wildlife Sanctuary of Bhutan is contiguous to the north, and Manas National Park lies to the east of BTR.
- **Rivers**: Jayanti, Sankosh, Raidak, Churnia, Turturi, Dima, Nonani, and Phashkhawa.
- **Conservation Initiatives**
  - **Rajabhatkhawa Vulture Breeding Center**: Situated at Buxa Tiger Reserve, was established for the breeding and conservation of endangered Indian vultures.

PIB

Jan 3

SMART 2.0
(Syllabus: GS Paper 2 – Govt Scheme)

‘SMART 2.0’ launched for Ayurveda Teaching Professionals

Context: The Central Council for Research in Ayurvedic Sciences (CCRAS) along with National Commission for Indian System of Medicine (NCISM) has launched 'SMART 2.0' program.

SMART 2.0

- **Aim**: To promote robust clinical studies in priority areas of Ayurveda with Ayurveda academic institutions/hospitals across the country through mutual collaboration.
- **Objective**: To generate a tangible evidence to demonstrate efficacy and safety of Ayurveda interventions using interdisciplinary research methods and translating it into public health care.
- **SMART 1.0**: Around 10 diseases were covered with the active participation of teaching professionals from 38 colleges.

SMART’ (Scope for Mainstreaming Ayurveda Research in Teaching Professionals) Program

- **Objective**: To enhance scientific research in priority healthcare areas by leveraging the resources of Ayurveda colleges and hospitals.
- **Focus Areas**: These include Osteoarthritis, Iron Deficiency Anaemia, Chronic Bronchitis, Dyslipidemia, Rheumatoid Arthritis, Obesity, Diabetes Mellitus, Psoriasis, Generalised Anxiety Disorder, and Non-alcoholic Fatty Liver Disease (NAFLD).
- **Communication of Details through NCISM**: All pertinent information, such as contact details, eligibility criteria, and the application process, has been disseminated to recognized academic institutions and hospitals through the National Council of Indian Systems of Medicine (NCISM).
- **Teacher Motivation**: The 'SMART' program is set to encourage teachers to undertake projects in designated healthcare research areas. The initiative aims to build a substantial database and foster a culture of research in academic institutions.

THE HINDU Page 10

CYBER THREAT

(Syllabus: GS Paper 3 – Sci and Tech)

'50% of cybercrime plaints originate in China, pockets of Cambodia and Myanmar'

Vijaita Singh
NEW DELHI

Around 50% of cybercrime complaints received on the national cybercrime helpline every day have their origin in China and pockets of Cambodia and Myanmar, Rajesh Kumar, chief executive officer of the Indian Cyber Crime Coordination Centre (I4C), Ministry of Home Affairs (MHA), said on Wednesday.

Addressing a press conference, he said that on average 5,000 cyber complaints are registered in the country every day. From April 1, 2021-December 31, 2023, ₹10,319 crore had been lost to cyber fraud, he said. In 2023, around 15.5 lakh cybercrime complaints were received, up from 26,049 such complaints in 2019. In the past five years, 31 lakh cyber crime complaints were received and FIRs were filed in 66,000 cases.

"[Around] 5,000 complaints are filed every day. Our estimate is that around 40-50% originate outside the country. When I say outside the country, the country that you mentioned, not the nation state, but the gangs that are operating from those countries are running these applications. We have pockets in Cambodia and Myanmar. We are seeing Chinese apps. Who is denying?" Mr. Kumar said responding to a question by *The Hindu* on the volume of frauds and cybercrimes that originate from China.



On average 5,000 cyber complaints are registered in the country a day, an official said.

People affected by financial frauds and other online crimes can register complaints on cybercrime.gov.in or the 1930 helpline number.

The 1930 helpline is operational in all 36 States and Union Territories and if a call is made by a victim of financial fraud within an hour of the crime being committed, the banks are able to block the money.

₹1,127 crore blocked

Since April 2021, ₹1,127 crore has been blocked in several bank accounts on the complaint of 4.3 lakh victims. However, only ₹100 crore has so far been returned to complainants.

The officer said this was an area of concern and the government is working on a mechanism to help people get back their blocked money.

"We have consulted banks who told us that they need a court order to release the money blocked in someone's account. We have had legal consultations with the concerned authority and have devised a Standard Operating Procedure (SOP) to address the issue. It awaits last legal vetting. We should be able to address the problem in the next few months," Mr. Kumar said.

Context: According to Ministry of Home Affairs (MHA), around 50% of cyber-crime complaints received on the national cyber crime helpline every day have their origin in China and pockets of Cambodia and Myanmar, Rajesh Kumar, chief executive officer of Indian Cyber Crime Coordination Centre (I4C).

Highlights of Report

- **Origin**: Criminal gangs operating from countries like Cambodia and Myanmar are behind these fraudulent activities.
- **Government Action**: Since April 2021, ₹1127 crore has been blocked in various bank accounts based on complaints from 4.3 lakh victims.
  - Only ₹100 crore has been returned to complainants, prompting the government to address the concern and develop a mechanism for recovering blocked funds.
- **Integration of Financial Institutions with Helpline**: 263 banks, e-commerce companies, and the National Payments Corporation of India (NPCI) have been integrated with the 1930 helpline.
  - Automated tickets are generated upon receiving complaints, ensuring swift action even if the money transfers across different banks.
- **Blocking Operations**: MHA reports the blocking of 2,95,461 SIM cards, 2,810 websites, 595 mobile applications, and 46,229 IMEI numbers based on complaints.
- **Regional Hotspots**: West Bengal, Odisha, and Assam are identified as hotspots for fraudulent procurement of SIM cards.
- **Cybercrime Trends and Statistics**: Noteworthy cybercrime trends from the previous year include 1.49 lakh complaints against Investment Apps/Websites, 85,000 related to Illegal loan Apps, 43,000 on Customer Care Number and OTP frauds, 34,000 regarding Impersonation or takeover of social media accounts, and 19,000 complaints of Sextortion.

INDIAN EXPRESS Page 10

VVPAT
(Syllabus: GS Paper 2 – Polity)

VVPATs and the fresh debate over them

EXPRESS NEWS SERVICE
NEW DELHI, JANUARY 3

CONGRESS LEADER Jairam Ramesh has written to Chief Election Commissioner Rajiv Kumar requesting that a team of INDIA bloc leaders be provided an opportunity to meet him to put forward their views on VVPATs.

In his letter to Rajiv Kumar, Jairam Ramesh said that on December 20, 2023, INDIA leaders had requested for an appointment with the ECI based on a resolution passed at their meeting the previous day. The resolution had called for 100% verification of VVPAT slips.



Officials commissioning EVMs and VVPATs in Agartala in Feb 2022. *File*

What are VVPATs?

When a vote is cast, the Voter Verifiable Paper Audit Trail (VVPAT) machine, which is attached to the ballot unit of the Electronic Voting Machine (EVM), prints out a slip of paper with the voter's choice indicated on it. Though it remains behind glass, the printed slip is visible for seven seconds so the voter can see her vote has been recorded correctly, before it falls into a box underneath.

The idea of the VVPAT machine emerged in 2010, when the ECI held a meeting with political parties to discuss ways to make the polling process more transparent. It was used for the first time in the Noksen Assembly constituency of Nagaland in 2013, after which it was introduced elsewhere in a phased manner. The 2019 Lok Sabha elections became the first General Election to have 100% of EVMs having attached VVPATs.

What percentage of VVPAT slips are counted at present?

The EC asked the Indian Statistical Institute (ISI) in 2018 to come up with a "mathematically sound, statistically robust and practically cogent sample size for the internal audit of the VVPAT slips with electronic result of EVMs", the ECI had told the Supreme Court last year.

The ECI also met political parties to discuss the issue, where demands for 10% to 100% counting emerged. In February 2018, the ECI mandated the counting of VVPAT slips of one randomly selected polling station per Assembly constituency. This was increased to five polling stations per Assembly seat, following an SC judgment in April 2019 on a petition filed by TDP leader Chandrababu Naidu.

Meanwhile, the ISI report to the EC in March 2019 recommended that a random sample of 479 EVMs be selected for counting of VVPAT slips.

What has the ECI said on 100% counting?

Last year, the ECI told the Supreme Court that verification of VVPATs of five randomly selected polling stations per Assembly seat, with more than 4,000 total Assembly seats in India, translated to 20,600 EVM-VVPAT systems — well above the ISI's recommendation of 479.

In Lok Sabha and Assembly elections so far, the EC said, 38,156 VVPATs have been checked randomly. "Not a single case of transfer of vote meant for candidate 'A' to candidate 'B' has been detected," the ECI said.

The ECI said pressing for 100% verification was a "regressive thought and tantamount to going back to the days of manual voting using ballot system". It said manual counting of all VVPAT slips would take time and introduce the potential of human error.

Context: Recently, the opposition wrote to the Chief Election Commissioner, urging that a delegation of Indian group leaders be granted an opportunity to meet with him and his colleagues to present their perspective on VVPATs.

Voter Verifiable Paper Audit Trail (VVPAT)

- **About**: When a vote is cast, the VVPAT machine, attached to the Electronic Voting Machine (EVM), prints a slip displaying the voter's choice.
  - The printed slip, visible for seven seconds behind glass, allows voters to confirm the accurate recording of their vote before it drops into a collection box.
- **Origins of VVPAT**: The idea of the VVPAT machine emerged, leading to the EC referring the matter to its Technical Expert Committee for further exploration.
- **Developed by**: Bharat Electronics Limited (BEL) and Electronics Corporation of India (ECIL).
- **Trails**: Field trials in various locations, **including Ladakh, Thiruvananthapuram, Cherrapunjee**, East Delhi, and Jaisalmer, took place in July 2011.
  - After design refinement, additional trials, and feedback from political parties, the expert committee approved the VVPAT design in February 2013.
- **Legislative Amendments**: The Conduct of Elections Rules, 1961, were amended in 2013 to allow the attachment of a printer with a drop box to the EVM.
- **Phase-wise Implementation**: The VVPAT was first used in all 21 polling stations of the Noksen Assembly constituency in Nagaland during the 2013 elections.
  - The EC **decided to introduce VVPATs gradually, and by June 2017**, 100% of VVPATs were utilized in polls.
- **Landmark in 2019**: The 2019 Lok Sabha elections marked a historic moment as it became the first general election with 100% of EVMs being attached to VVPATs, ensuring a more transparent and verifiable voting process.

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