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THE HINDU

ET BS TOI

The Indian EXPRESS livemint pib

DownToEarth
FORTNIGHTLY ON POLITICS OF DEVELOPMENT, ENVIRONMENT AND HEALTH

Science Reporter

विज्ञान एवं प्रौद्योगिकी मंत्रालय
MINISTRY OF SCIENCE AND TECHNOLOGY
सत्यमेव जयते



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THE HINDU Page 3

AMUR FALCONS
(Syllabus: GS Paper 3 - Env & Eco)

Manipur bans hunting of Amur falcons

The Hindu Bureau
IMPHAL

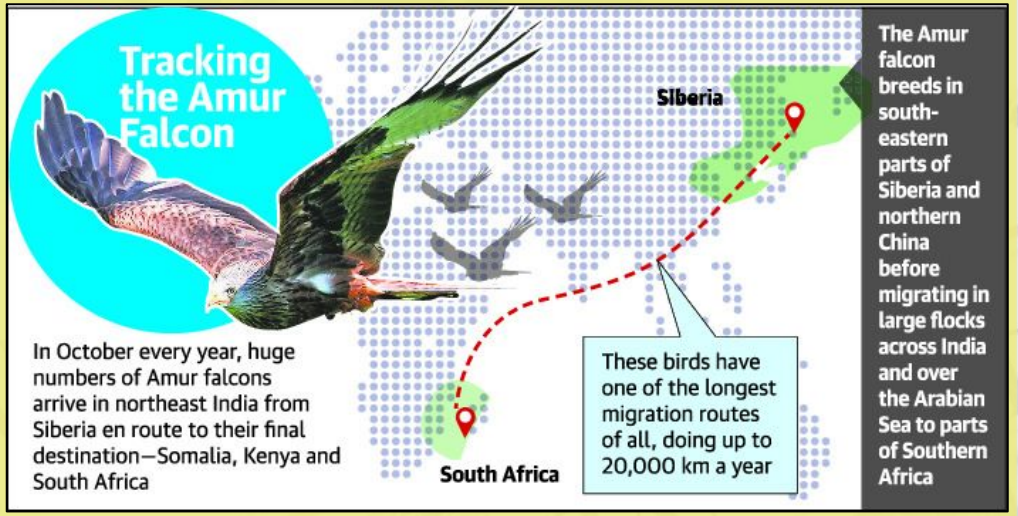
The hunting, killing and sale of amur falcons has been banned by the district magistrates of Tamenglong and Senapati districts in Manipur.

The migratory birds, which summer in Siberia, Mangolia and East China between May and September, arrive in Manipur, Nagaland and Arunachal Pradesh in October, with over two lakh coming to Manipur alone.

Context: The hunting, killing and sale of **amur falcons** has been banned by the district magistrates of Tamenglong and Senapati districts in Manipur.

Amur Falcons

- **About**: It is a small raptor of the falcon family.
  - Amur falcons, the **world's longest travelling raptors** start travelling with the **onset of winters.**
- **Scientific Name**: Falco amurensis.
  - They get their name from the **Amur River** that forms the border between Russia and China.
- **Habitat**: They breed in Siberia and Northern China and migrate to winter in Southern Africa.
  - Migrates west through India and across the Arabian Sea to Southern Africa.
  - **Nagaland** is known as the **Falcon Capital of the world.**
  - **Doyang Lake in Nagaland** is better known as a stopover for the Amur falcons during their annual migration from their breeding grounds to warmer South Africa.
- **Food**: Feeds on dragonflies and insects.
- **Threats**: Illegal trapping and killing during migration, prone to habitat loss from agricultural practices and land reclamation.
- **Conservation Status:**
  - **International Union for Conservation of Nature (IUCN) Red List status:** least concern
  - **Indian Wildlife Protection Act, 1972**: Protected under Schedule IV.
  - **Convention on Migratory Species**: India is a signatory of the Convention on Migratory Species. As per this convention, it is mandatory to protect the birds.





BUSINESS STANDARD

Page 1

GOODS AND SERVICES TAX

(Syllabus: GS Paper 3 - Economy)

Oct GST mop-up 2nd highest ever

Collection rises 16.6% to ₹1.52 trillion on festival boost

SHRIMI CHOUDHARY
New Delhi, 1 November

The government collected ₹1.52 trillion as goods and services tax (GST) in October, a 16.6 per cent rise year-on-year, driven by festival-related spending, higher tax rates, and better compliance. This was the second-highest monthly collection since the implementation of the indirect tax regime in July 2017. GST collection touched a record high of ₹1.67 trillion in April.

Of the total gross GST mop-up in October, central GST (CGST) was ₹26,039 crore, state GST (SGST) ₹33,396 crore, integrated GST (IGST) ₹81,778 crore (including ₹37,297 crore collected on import of goods), and cess was ₹10,505 crore (including ₹825 crore collected on import of goods), according to the provisional data released by the finance ministry on Tuesday.

"This is the ninth month — and the eighth month in a row — that monthly GST revenue has been more than ₹1.4 trillion," the ministry said.

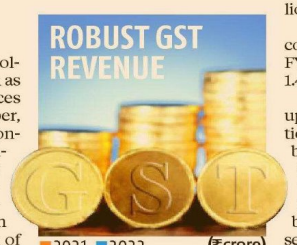
In September 2022, as many as 83 million e-way bills were generated compared to 77 million in the previous month.

Economists expect CGST collection to exceed the FY23 Budget Estimates by ₹1.3-1.4 trillion.

"The sharp sequential pick-up in the headline GST collection in October reflects a combination of quarter-end flows relating to the transactions in the previous month, as well as the surge in GST e-way bills ahead of a robust festival season. With the festival season in October, the generation of GST e-way bills is expected to have remained high, which should bolster the collection in November," said Aditi Nayar, chief economist, ICRA.

Nayar said the dip in the YoY growth in GST collection in October was expected given the normalising base, and may continue for the next few months. "We continue to expect CGST collection to exceed the FY2023 BE by ₹1.3-1.4 trillion," she said.

Turn to Page 6



	2021	2022
Apr	139,708	1,67,540
May	97,821	1,40,885
Jun	92,800	1,44,616
Jul	1,16,393	1,48,995
Aug	1,12,020	1,43,612
Sep	1,17,010	1,41,968
Oct	1,30,127	1,51,718

(₹crore)

Source: Ministry of Finance

UPI TRANSACTIONS HIT RECORD 7 BILLION ON FESTIVAL DEMAND P4

PAGE 2

PVs get a festive high in Oct: Sales see sharp rise

Domestic passenger vehicle sales saw sharp growth in October due to increased availability of semiconductor chips and rising consumer confidence. Sales in the first post-Covid festival season saw a 30.7 jump.

PAGE 4

At 12.6%, credit to industry grows fastest in 8 years

Credit to industry grew at the fastest pace in eight years in September 2022, aided primarily by a pick-up in working capital loans from corporates. It was up 12.6 per cent year-on-year to ₹32.4 trillion.

PAGE 4

Manufacturing PMI recovers amid easing pressures

The purchasing managers' index for manufacturing recovered to 55.3 in October from 55.1 in September as price pressures were contained. The survey reflected an improvement in employment and purchases by factories.

Context The government collected ₹ 1.52 trillion as goods and services tax (GST) in October, a 16.6 per cent rise year-on year, driven by festival related spending, higher tax rates, and better compliance.

Goods and Services Tax

- **Origin**: Introduced through the 101st Constitution Amendment Act, 2016 and launched in India on 1 July 2017.
- **Slogan**: 'One Nation One Tax'.
- **About:** It is a comprehensive, multistage, destination-based tax comprehensive because it has subsumed almost all the indirect taxes except a few state taxes.
  - It is essentially a consumption tax and is levied at the final consumption point.
  - It has a 4-tier tax structure for all goods and services under the slabs- 5%, 12%, 18% and 28%.
  - All these taxes are levied at rates mutually agreed upon by the Centre and the States.
- **3 types:**
  - Central GST to cover Excise duty, Service tax etc,
  - State GST to cover VAT, luxury tax etc.
  - Integrated GST (IGST) to cover inter-state trade.
    - IGST per se is not a tax but a system to coordinate state and union taxes.
- **Governing and decision-making body**: The GST Council headed by the Union Finance Minister is the governing and key decision-making body for GST.
  - **GST Council**: It is a joint forum of the Centre and the states.
    - It was set up by the President as per **Article 279A (1)** of the amended Constitution.
  - **Members**: Union Finance Minister (chairperson) and Union Minister of State (Finance) from the Centre.
    - Each state can nominate a minister in-charge of finance or taxation or any other minister as a member.
  - **Functions**: make recommendations to the Union and the states on important issues related to GST and decision on various rate slabs of GST.

INDIAN EXPRESS

Page 1

MINORITY STATUS IN INDIA

(Syllabus: GS Paper 1 - Indian Society)

Minority tag for Hindus: Govt seeks time, tells SC it is sensitive

ANANTHAKRISHNAN G
NEW DELHI, NOVEMBER 1

THE CENTRE has again sought time from the Supreme Court to complete consultations on demands to grant minority status to Hindus in states where their numbers have gone below others, saying "the matter is sensitive in nature and will have far-reaching ramifications".

In its fourth affidavit, filed Monday in the matter in response to petitions by Advocate Ashwini Kumar Upadhyay and others, the Centre said it had received comments from 14 states and 3 Union Territories on the issue so far, and has sent reminders to others to send in their views at the earliest.

The petitioners, who have relied on the Supreme Court's landmark 2002 decision in the TMA Pai case, have cast doubts on the legal sanctity of the consultation process, saying that after the ruling in the case, the Centre cannot notify anyone as minority anymore and, therefore, whatever deliberations it may be holding under the National Commission for Minorities Act, 1992 "cannot confirm minority status to anybody in a state".

In the TMA Pai case, the Supreme Court laid down that for the purposes of Article 30 — which deals with the rights of minorities to establish and administer educational institutions

CONTINUED ON PAGE 4

Context: The Centre has again sought time from the Supreme Court to complete consultations on demands to grant minority status to Hindus in states where their numbers have gone below others, saying "the matter is sensitive in nature and will have far-reaching ramifications".

Notification of minorities

- **Current status**: Currently, the only communities considered minorities are those that have received central government notification pursuant to section 2(c) of the NCM (National Commission for Minorities) Act, 1992.
  - **Notified minority community**: Muslims, Christians, Sikhs, Buddhists, Zoroastrians (Parsis) and Jains.
- **T.M.A Pai case (2002):** SC held that linguistic and religious minorities must be identified at the state level rather than at the national level.

Constitutional Provisions for Minority

- **Article 29:** Protection of interests of minorities.
  - **Article 29(1):** This provides any section of the citizens residing in India having a distinct culture, language, or script, the **right to conserve their culture,** language and script.
  - **Article 29(2):** The State shall not deny admission into educational institutes maintained by it or those that receive aid from it to any person based only on race, religion, caste, language, or any of them.
  - However, the SC held that the scope of this article is not necessarily restricted to minorities only, as **use of the word 'section of citizens' in the Article includes minorities as well as the majority.**
- **Article 30**: Right of Minorities to Establish and Administer Educational Institutions.
  - **Article 30(1)**: All religious and linguistic minorities have the right to establish and administer educational institutions of their choice. (Read about Minority Protection in India in the linked article.)
  - **Article 30(2):** The State shall not, when granting aid to educational institutions, discriminate against any educational institution on the ground that it is under the management of a minority, whether based on religion or language.
  - The protection under Article 30 is confined only to minorities (religious or linguistic) and does not extend to any section of citizens (as under Article 29).
- **Article 350b (Inserted by 7th Constitutional (Amendment) Act 1956)**: Special Officer for linguistic minorities.
  - There shall be a Special Officer for linguistic minorities to be **appointed by the President**
  - It would be the duty of the Special Officer to investigate all matters relating to the safeguards provided for linguistic minorities under the Constitution.

LIVEMINT

Page 1

CAPITAL BUDGET

(Syllabus: GS Paper 3 - Economy)

FY24 capex goal may be raised to ₹10 tn

Govt may double down on capital spending as private investments dry up

Ravi Dutta Mishra & Subhash Narayan

NEW DELHI

India is likely to double down on capital spending by allocating as much as ₹10 trillion to build ports, roads and other infrastructure in the next fiscal to spur growth as private investments remain anaemic despite record government spending, two people aware of the development said.

Finance minister Nirmala Sitharaman had announced a 35% increase in the capital expenditure target to a record ₹7.5 trillion for the year to 31 March, hoping the government spending would crowd in investments from the private sector.

But that has not happened as soaring inflation, monetary tightening, geopolitical risks and an uncertain global economic outlook have prompted companies, except some large conglomerates, to delay big projects.

The government hopes boosting government expenditure on infrastructure will help create jobs and sustain the economic recovery amid global headwinds. But finding the funds for the massive capital spending programme may still be a challenge as food, fuel and fertilizer subsidies have considerably strained government finances despite buoyant revenue collections. If Sitharaman allocates ₹10 trillion in the February budget, the capex estimates for the year starting 1 April may nearly match the previous year's increase.

Economists said the Centre's revenue position looks good as gross tax collection grew 24% in FY23 up to 8 October to ₹8.98 trillion after jumping 34% last fiscal. Moreover, expectations are that revenue may remain buoyant even in FY24, allowing for an expansionary budget that further pushes up public capital spending and providing a leg-up to improve the overall investment climate in the country.

Though a proposal on the quantum of increase is still being discussed by the finance ministry with the various infrastructure sector ministries, a lineup of big projects proposed by ministries for next year may require capex support, said the first person aware of the development.

TURN TO PAGE 6

MOVING THE NEEDLE

Finance minister Nirmala Sitharaman had in the last budget announced a 35% increase in capex goal to ₹7.5 tn for FY23.



A: Actual, BE: Budget estimate, RE: Revised estimate

Source: Budget document

SARVESH KUMAR SHARMA/MINT

Context: India is likely to double down on capital spending by allocating as much as ₹10 trillion to build ports, roads and other infrastructure in the next fiscal to spur growth as private investments remain anaemic despite record government spending.

Capital Budget

- **About**: It includes the Capital Receipts and Capital Expenditure.
- **Capital receipts**: These are receipts that **create liabilities** or reduce financial assets.
  - In the balance sheet, capital receipts are **mentioned in the liabilities section**.
  - The capital receipt has a **nature of non-recurrence.**
  - All capital receipts are **tax-free,** unless there is a proviso to tax it.
  - Capital receipts **can be both non-debt and debt receipts**
    - **Non-debt receipts:** those which do not incur any future repayment burden for the government.
      - **Examples of non-debt capital receipts**: Recovery of loans and advances, disinvestment, issue of bonus shares, etc
    - **Debt Receipts:** It has to be repaid by the government.
      - **Examples of debt capital receipts:** Market loans, issuance of special securities to public-sector banks, issue of securities, short-term borrowings, treasury bills, securities against small savings, state provident funds, relief bonds, saving bonds, gold bonds, external debt, etc, are all example of debt capital receipts.
- **Capital expenditure**: which leads to the creation of assets are long-term in nature and allow the economy to generate revenue for many years by adding or improving production facilities and boosting operational efficiency.
  - Along with the creation of assets, repayment of loan is also capital expenditure, as it reduces liability.
  - The central government's budget for 2022-23 showed a sharp jump in capital expenditure to a planned Rs 7.5 lakh crore.
  - This indicates the government is attempting demand-side support to the economy through CAPEX.

ECONOMIC TIMES

Page 1

INTERNATIONAL NORTH SOUTH TRANSPORT CORRIDOR

(Syllabus: GS Paper 2 - International Relations)

India Pitches INSTC, Chabahar for C Asian Economies

Jaishankar chides connectivity initiatives which violate sovereignty

DipanjanRoy.Chaudhury
@timesgroup.com

New Delhi: Foreign minister S Jaishankar has pitched the Chabahar port and international north south transport corridor (INSTC) via Iran as key enablers for growth of central Asia, while indirectly chiding the China Pakistan Economic Corridor for violating India's sovereignty.

"Underlined that we need better connectivity in the SCO region built on centrality of interests of central Asian states. Will unlock the economic potential of this region in which Chabahar port and INSTC could become enablers. Connectivity projects should respect the sovereignty and territorial integrity of member states and respect international law," Jaishankar said after a virtual meeting of the 21st Shanghai Cooperation Organisation heads of government meet on Wednesday.



Jaishankar at a virtual meeting of the 21st SCO heads of government–PTI

India has reservations against CPEC which passes through Pakistan occupied Kashmir. CPEC is the crown jewel of China's Belt and Road Initiative. At the successive SCO summits and meets including Tuesday's meet, India has refrained from backing BRI. Premier of China's state council, Li Keqiang, chaired Tuesday's meeting.

Following sanctions on Russia, the increase in trade volume has been greatly aided by INSTC. The Federation of Indian Export Organisations has stated that the route reduced voyage time to central Asia by 40% and reduced costs by 30%. The minister tweeted. "Among other issues highlighted in 2023, the UN International Year of Millets, India intends to foster greater cooperation with SCO member states on countering the food crisis. Spoke of Mission LiFE launched by PM Narendra Modi which envisions replacing prevalent 'use and dispose' economy by a circular economy," Jaishankar tweeted.

In his address, Jaishankar also underlined India's strong cultural and historical connect with the SCO region and reiterated India's firm commitment towards deepening multilateral cooperation in food and energy security, climate change, trade and culture. The minister drew attention to India's commitment in fighting climate change and also our achievements made in this direction. He emphasised India's strong recovery on the economic front. The Joint Declaration issued after the SCO meet said it noted Tajikistan's proposal to develop the strategy for economic development in SCO until 2030.

THE PROBLEM AREA

India has reservations against CPEC which passes through Pakistan occupied Kashmir

route allows the movement of goods between India and Russia to be completed in 25 days, compared to 40 days on established shipping routes. India and Iran are working on bilateral arrangements to include Chabahar under this framework.

In yet another indirect criticism of China for disallowing fair market access to India, Jaishankar called for fair market access for increasing bilateral trade. "Our total trade with SCO members is only $141 billion, which has potential to increase manifold. Fair market access is to our mutual benefit and only way to move forward," the



Context: Foreign minister has pitched the Chabahar port and international north south transport corridor (INSTC) via Iran as key enablers for growth of central Asia, while indirectly chiding the China Pakistan Economic Corridor for violating India's sovereignty.

International north south transport corridor (INSTC)

- **About:** It is a **7,200 km-long multimodal transportation network** encompassing sea, road, and rail routes to offer the shortest route of connectivity.
  - It links the Indian Ocean to the Caspian Sea via the Persian Gulf onwards into Russia and Northern Europe.
- **Origin**: In 2000, **India, Iran and Russia** had signed the INSTC agreement.
- **Objective**: to increase trade connectivity between major cities such as Mumbai, Moscow, Tehran, Baku, Bandar Abbas, Astrakhan, Bandar Anzali etc.
- **Regions involved:** India, Iran, Afghanistan, Azerbaijan, Russia, Central Asia and Europe.
- **Significance**: It will synchronize with the Ashgabat agreement which is a Multimodal transport agreement signed by India, Oman, Iran, Turkmenistan, Uzbekistan and Kazakhstan, for creating an international transport and transit corridor facilitating transportation of goods between Central Asia and the Persian Gulf.

Chabahar Port

- **Location**: It is a seaport in Chabahar **located in southeastern Iran**, on the Gulf of Oman.
  - It serves as Iran's only oceanic port, and consists of two separate ports named Shahid Kalantari and Shahid Beheshti.
- **Significance**: It is considered a gateway to golden opportunities for trade by India, Iran and Afghanistan with Central Asian countries.

TIMES OF INDIA

Page 11

VOTING RIGHTS FOR NRI

(Syllabus: GS Paper 2 - Polity & Governance)

Proxy votes for NRIs is govt's call, says SC

TIMES NEWS NETWORK

New Delhi: The Supreme Court on Tuesday winded up its proceedings going on for the last nine years on a PIL seeking its direction to make provision for NRIs and migrant workers to cast their votes through proxy voting or postal ballot and left it for the Centre to take a call on the issue.

Noting that the Centre had already introduced a bill in Parliament on the issue, which was passed by Lok Sabha but lapsed in Rajya Sabha, a bench of **Chief Justice U U Lalit** and Justice Bela M Trivedi said the government was conscious of the issue raised in the petition and the Centre would take a decision.



With attorney general R Venkataramani assured the court that "every step will be undertaken to make overseas Indians and migrant labourers part of electoral process", the bench disposed of the case which was filed in 2013.

The court has passed various orders in the last nine years which resulted in the Centre introducing the bill.

In August 2018, Lok Sabha passed a bill that proposed to amend the Representation of the People Act, 1951 to enable overseas electors to appoint proxies to cast their votes in elections to Lok Sabha and state assemblies.

As petitioners pleaded the court to keep the matter pending and nudge the Centre to frame law, the bench said it cannot issue a mandamus to the legislature or executive and disposed of the petitions.

Context: The Supreme Court winded up its proceedings going on for the last nine years on a PIL seeking its direction to make provision for NRIs and migrant workers to cast their votes through proxy voting or postal ballot and left it for the Centre to take a call on the issue.

Voting Rights for NRIs

- **Right to Vote:** An NRI can vote in the constituency in his/her place of residence, as mentioned in the passport, is located.
  - **Voting rights for NRIs were introduced in 2011**, through an amendment to the Representation of the People Act 1950.
- **Limitations**: He/She can **only vote in person** and will have to produce her passport in original at the polling station for establishing identity.
- **Voting by Postal Ballots**: Any NRI interested in voting through the postal ballot will **have to inform the Returning Officer (RO)** not later than five days after the notification of the election.

Postal Ballots

- **About**: It is also called Electronically Transmitted Postal Ballot Papers (ETPB) which is developed by Election Commission of India with the help of the Centre for Development of Advanced Computing (C-DAC)
  - Under this, ballot papers are distributed electronically to electors and are then returned to the election officers via post.
- **Eligible voter**:
  - Members of the armed forces like the Army, Navy and Air Force, members of the armed police force of a state (serving outside the state), government employees posted outside India and their spouses are entitled to vote only by post.
  - While prisoners are not allowed to vote, people under preventive detention can cast their votes through postal ballots.
  - Special voters such as the P**resident of India, Vice President, Governors, Union Cabinet ministers, Speaker of the House and government officers** on poll duty have the option to vote by post.
  - Recently, **a new category of 'absentee voters' was introduced** in which they can also opt for postal voting.
    - These voters are employed in essential services and unable to cast their vote due to their service conditions. Currently, officials of the Delhi Metro Rail Corporation, Northern Railway (Passenger and Freight) Services and media persons are notified as absentee voters.
  - Recently, **senior citizens above the age of 65 and voters who test positive for COVID19 or are suspected to be COVID-affected** were allowed to cast their vote by post.

Proxy voting

- **About**: Under proxy voting, a registered elector can delegate his voting power to a representative.
- **Origin**: This was introduced in 2003 for elections to the Lok Sabha and Assemblies but on a limited scale.
- **Eligibility**: Only a "classified service voter" which includes members of the armed forces, BSF, CRPF, CISF, General Engineering Reserve Force and Border Road Organisation is allowed to nominate a proxy to cast a vote on his behalf in his absence.

PIB

Nov 2

INDIA WATER WEEK

(Syllabus: GS Paper 1 - Geography)

PRESIDENT OF INDIA INAUGURATES 7TH INDIA WATER WEEK

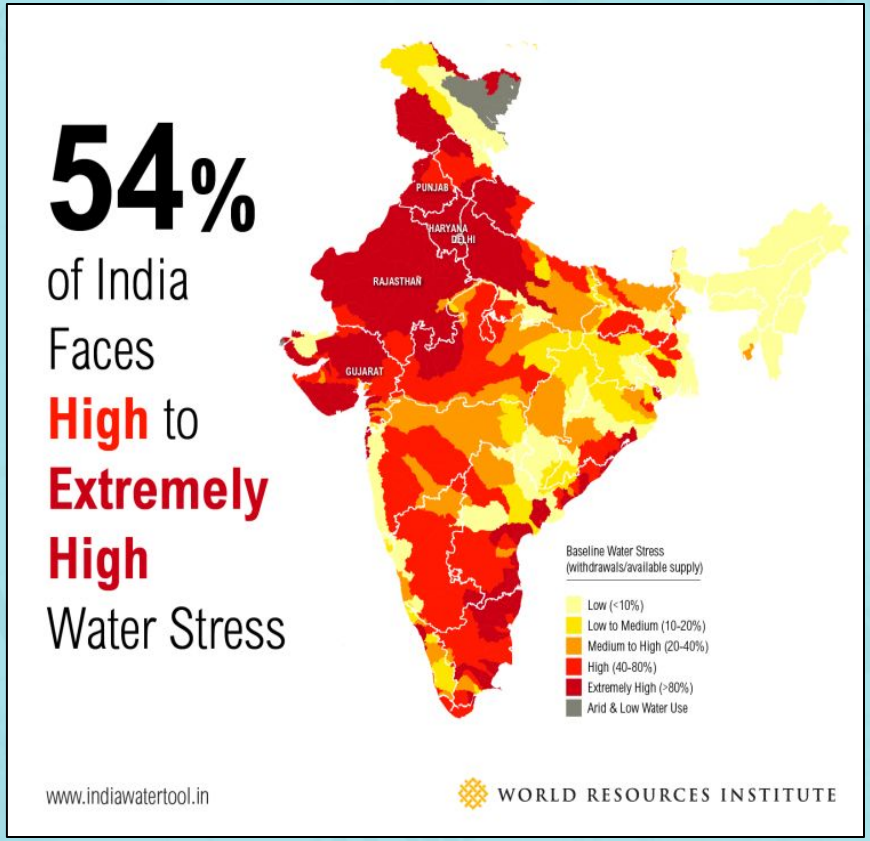
Context: The President of India inaugurated the 7th India Water Week at Greater Noida, Uttar Pradesh.

7th India Water Week

- **About**: It is a multi disciplinary international conference focusing on new approaches for long term water planning and management
- **Theme**: Water Security for sustainable development with equity.
- **Organized by:** **Ministry of Jal Shakti**, Department of Water Resources, River Development & Ganga Rejuvenation.

India Water Week

- **Background**: Government is organising India Water Week **since 2012** as an annual international event on order to establish an international event focused on water resources of India.
- **Significance**: The recommendations and action points emerged during events of India Water Week will send to all concerned Ministries of Central Government as well as all state governments for their appropriate implementation.



PIB

Nov 2

MANGARH DHAM

(Syllabus: GS Paper 1 - Art & Culture)

PM attends public programme 'Mangarh Dham ki Gaurav Gatha'

Pays homage to the sacrifices of unsung tribal heroes and martyrs of freedom struggle

Context: The Prime Minister attended a public programme 'Mangarh Dham ki Gaurav Gatha' today and paid homage to the sacrifices of unsung tribal heroes and martyrs of the freedom struggle.

Mangarh Dham

- **Location**: located in the district on the **Gujarat-Rajasthan border**, a region with a large tribal population.
  - The place is also known as the Adivasi Jallianwala.
- **Historical significance:** a site of **a tribal uprising where a massacre of over 1500 Bhil tribal** freedom fighters took place.
  - On 17th November, 1913, British forces opened fire on tribals gathered at the site who were holding a meeting in protest, **led by Govind Guru**, killing over 1,500.

Bhil Tribe

- **About**: commonly referred to as **bowmen of Rajasthan and South Asia's** largest tribe.
  - The Bhil tribe is **called "Dhanush Purush of India"** because they are highly adept at learning Dhanush.
- **Historical significance**: members of the **pre-Aryan race.**
  - The name **Bhil is mentioned in the ancient epics** of Mahabharata and Ramayana.
  - The term **'Bhil' is derived from the word villu or billu**, which is known as Bow in the Dravidian language.
- **Classified into two types:**
  - **Central or pure bhills**: can be found in the mountain regions of Madhya Pradesh, Maharashtra, Gujarat, and Rajasthan.
  - **Eastern or Rajput Bhils**: can be found in Tripura's northwestern regions.
- **Associated Painting:** The Bhilala subdivision is known for its **Pithora painting.**
- **Associated dance**: Ghoomar, symbol of femininity, is a traditional folk dance of the Bhil tribe.
  - The young women take part in this dance and declare that they are stepping into women's shoes.
- **ST status**: considered as Schedule Tribe in Andhra Pradesh, Chhattisgarh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Tripura.

DTE

Nov 2

LITHIUM-ION BATTERIES

(Syllabus: GS Paper 3 - Sci & Tech)

SCIENCE & TECHNOLOGY

New material may hold promise for more efficient lithium-ion batteries

Researchers from IIT Gandhinagar and Japan Advanced Institute of Science and Technology discovered a new anode material that could charge electric vehicles at ultra-fast speeds

Context: Indian researchers have discovered a new anode material, which could be helpful in ensuring the life and fast charging of lithium-ion batteries (LIBs).

Key Points

- The **new two-dimensional (2D) anode material is developed using Nano sheets** derived from titanium diboride (TiB2), which resemble a stack of sandwiches, where metal molecules exist between layers of boron.
- LIBs have the **anode material as the negative electrode**, which is attached to the cathode material in the Li-ion battery cell.
- The **anode materials in a lithium-ion cell act as the host**, enabling lithium-ion intercalation/de-intercalation during the battery's charge or discharge cycle.
- LIBs with Graphite anode can power an electric vehicle for hundreds of kilometres on a single charge but **they are prone to fire hazards.**
- **Lithium Titanate anodes are safer and more preferred alternatives**, and they also facilitate fast charging.
- Lithium Titanate anodes have **a lower energy density,** so they would need more frequent recharging.

Lithium-ion batteries (LIBs)

- **About**: A type of **rechargeable battery.**
- **Mechanism**: It **use aqueous electrolyte solutions,** where ions transfer to and fro between the anode (negative electrode generally made of graphite) and cathode (positive electrode made of lithium), triggering the recharge and discharge of electrons.
- **Features**: High Energy Density, Low Self Discharge, Low to Minimum Maintenance and available in various shapes and sizes.

Lithium

- A chemical element with the **symbol Li.**
- Soft, silvery-white metal.
- **Lightest metal** and the lightest solid element (Under standard conditions).
- Stored in mineral oil due to **highly reactive and flammable.**
- An **alkali metal and a rare metal.**
- **Usage**:
  - To make useful alloys
  - In Thermonuclear reactions.
  - To make electrochemical cells
- **Largest Reserves in the world**: Chile
- **India's first ever Lithium deposit:** Southern Karnataka's Mandya district.

DTE

Nov 2

AEROSOL CONCENTRATION

(Syllabus: GS Paper 3 - Env & Eco)

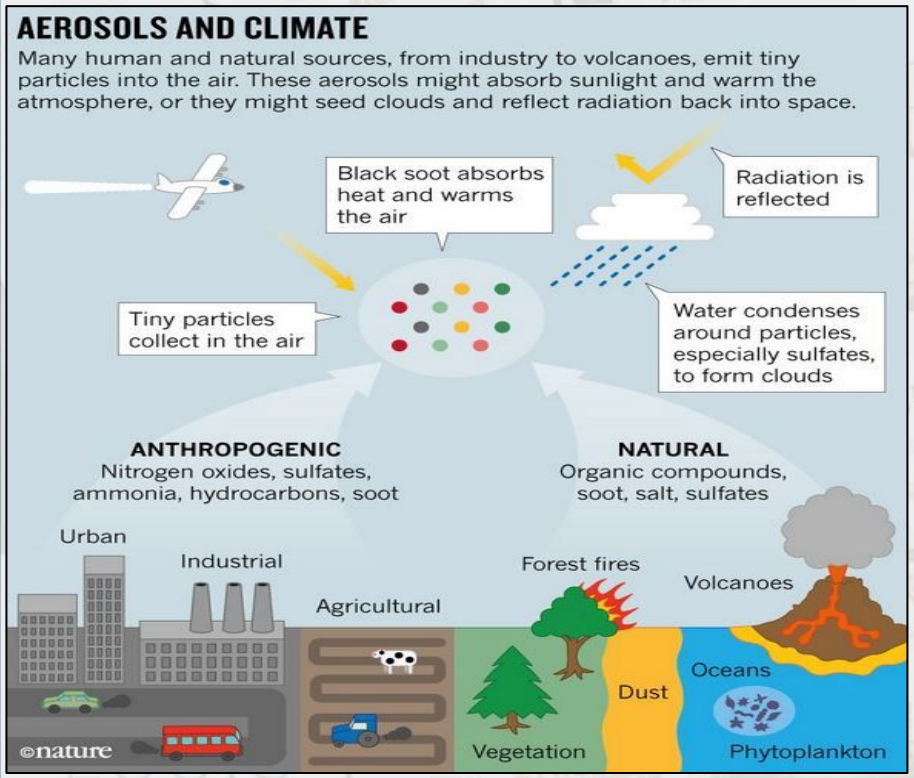


Climate models, ground assessments return differing readings of aerosol concentration: Study

Investigating the causes behind the differences necessary for more accurate results, say experts

NEXT NEWS >

By Rohini Krishnamurthy
Published: Tuesday 01 November 2022



Context: There were differences in the aerosol concentrations in the atmosphere as measured by ground observations and climate models, according to a new study.

Key points

- Both climate models and ground measurements showed that **aerosol concentrations are on a decline.**
- It is notable that the **greatest differences were found in particle size**, which plays a key role in the cloud formation process

Aerosols

- **About**: Aerosols are **tiny particles or droplets** that float in the air and influence climate.
- **Location**: These particles are **mainly situated in the low layers of the atmosphere (< 1.5 km)** since aerosol sources are located on the terrestrial surface.
    - Certain aerosols can still be found in the stratosphere, especially volcanic aerosols ejected into the high altitude layers.
- **Sources**: The sources of aerosols are **erupting volcanoes, sea salt and wildfires**. Humans, too, add aerosols to the atmosphere by **burning fossil fuels such as coal, oil and gas.**
- **Effects of aerosols:**
    - Aerosols can damage lung tissue and **lead to lung diseases.**
    - They **influence the climate** by changing how much solar energy is absorbed or reflected away from Earth.
    - Aerosols influence the Earth's climate by **acting as seeds on which clouds form.**
    - Increased aerosol particles can **lead to more but smaller cloud droplets**, which may likely reduce rains that fall from the cloud.

THANK YOU!

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