theIAShub

AUGUST

31

CRUX 10

10 News. 10 Sources. One Place

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



MK Yadav Sir

Table of Contents

1. Pricing of LPG
2. IT Hardware PLI Scheme
3. Regulation of UCB
4. Atma Nirbhar Rozgar Yojana
5. Auctioning of Critical Mineral
6. Kolkata Metro Railway
7. Ladakh Issue
8. Addis Ababa Declaration
9. Fungi And Funga
10. Cathode Materials

PRICING OF LPG

(Syllabus: GS Paper 3 - Economy)

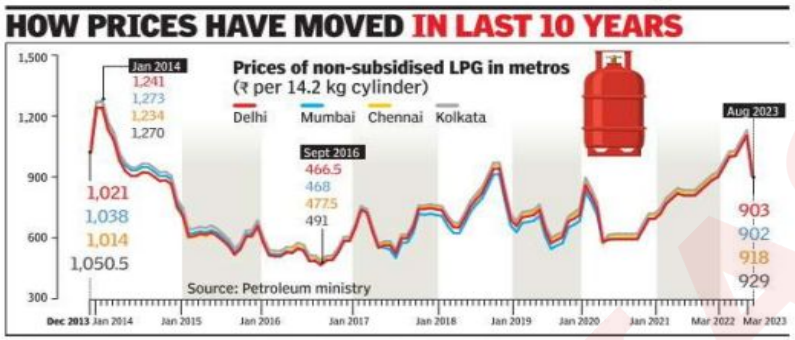
LPG cut: ₹18.5k cr relief to buyers

Sidhartha & Sanjay Dutta | TNN

New Delhi: The government is likely to put LPG (cooking gas supplied to households in cylinders) price on freeze for the rest of the year, after announcing a cut of Rs 200 per cylinder on Tuesday, providing a relief of over Rs 18,500 crore to consumers during the remaining seven months of the fiscal.

State-run fuel retailers are left with an estimated profit of more than Rs 100 per domestic refill even after the reduction. The government has decided to compensate them for any possible losses after reconciling the accounts for the year, sources told **TOI**.

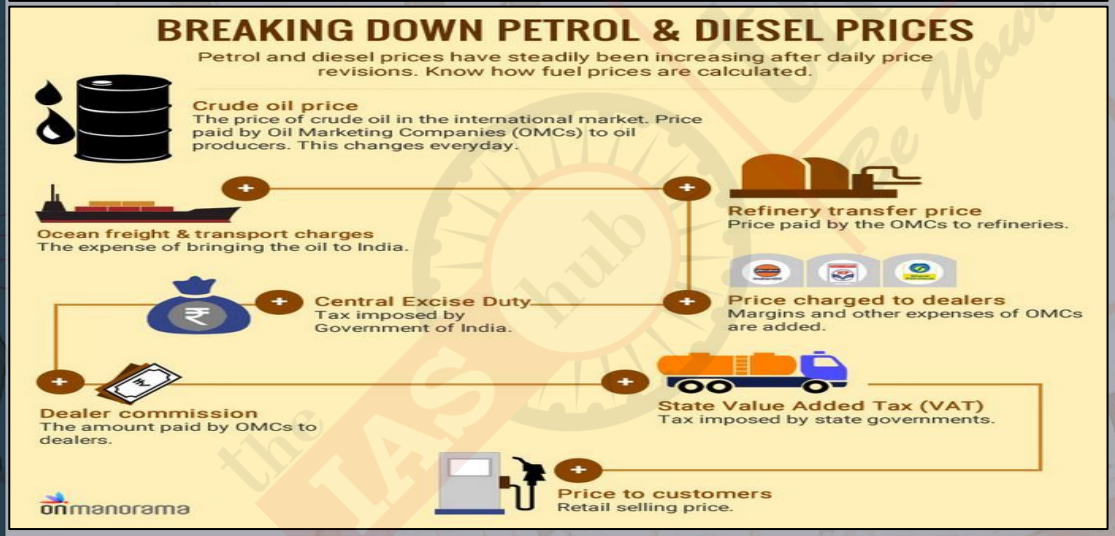
The reduction of Rs 200 in the price of refills is estimated to provide an annual relief of Rs 32,000 crore for 33 crore households, given that nearly 160 crore refills were consumed in 2022-23.



Officials, however, expect higher consumption this year as the 75 lakh new Ujjwala connections will be given and beneficiaries, who had joined the scheme earlier, are expected to buy more cylinders now that the relief has been increased to Rs 400 for them. Ujjwala households currently have an average annual consumption of four cylinders, while it hovers above eight for general category consumers.

"At this point of time, it is not possible for the government to assess how prices will behave for the remaining part of the year. But given that the current price is the administered price, we will compensate the oil companies in case they face any shortfall," said a source.

The government had in 2022-23 given a one-time grant of Rs 20,000 crore to state-run fuel retailers for not raising domestic gas refill prices, in spite of a surge in benchmark Saudi Contract Price. India is heavily dependent on imports for meeting LPG demand.



Context: The **price of domestic LPG cylinders has been cut by Rs 200 for all connections,** in all markets across the country.

- This decision comes amid high inflation and ahead of crucial state and general elections.
- India has a **total of 314 million domestic LPG consumers**.

Pricing of LPG

- The price of LPG is revised in India as per a formula known as **import parity price (IPP)**. The common practice is to revise the price of LPG cylinders on a month-on-month basis.
- The IPP is **calculated as per Saudi Aramco's LPG price,** the world's largest producer.
- The price includes costs like **free on board (FOB) price, ocean freight, custom duties, port charges and insurance cost among other things.**
- The price thus **calculated in US dollars** is then converted to Indian rupees.
- To the international price, **charges added domestically** include inland freight costs, Oil companies' margins, bottling costs, marketing expenses, dealer commissions and the Goods and Services Tax (GST).
- The final price thus calculated gives the **retail selling price for non-subsidised cooking gas cylinders** for consumers across different states.
- Many people in India avail subsidies **offered by the central government on LPG cylinders.**
- The **subsidy amount** is subject to change from one month to the next based on the international price of LPG and fluctuations in currency value.
- An **increase in international LPG prices** or weakness in the rupee, or both, translates into higher LPG prices in India.
- The **international price for LPG fluctuates** in accordance with the price of its main raw material, crude oil.

BUSINESS STANDARD

Page 1

IT HARDWARE PLI SCHEME

(Syllabus: GS Paper 3 - Economy)

HP, Dell, Lenovo among 38 to apply for IT hardware PLI

SOURABH LELE
New Delhi, 30 August

In a big win for the government's revised information technology (IT) hardware production-linked incentive (PLI) scheme, a total of 38 companies have expressed interest in commencing manufacturing of personal computers (PCs), laptops, tablets, servers, and edge computing devices within the country.

Major global PC manufacturers, including Dell, Hewlett Packard, Foxconn (via a subsidiary), Asus, Acer, and Flex, have submitted their applications ahead of the Wednesday deadline.

The scheme aims to generate incremental production worth ₹3.35 trillion over the next six years, said Ashwini Vaishnaw, Union Minister of Communications and IT.

Of the 38 applications received under PLI 2.0, approximately eight firms have applied under the newly introduced 'hybrid' category of the scheme. Around 25 applications have been submitted by local companies, confirmed an official from the Ministry of Electronics and IT (MeitY). Notable local applicants include Dixon Technologies (India), VVDN Technologies, Optiemus Infracom, and Sahasra Electronic Solutions.

The revised scheme offers additional incentives for assembling devices using locally manufactured components. Companies that assemble hardware with domestically produced processors may receive an incentive of 3 per cent of incremental sales.

Turn to Page 6

'VALUE ADDITION MAY HIT 70% WITH INDIA-MADE MEMORY CHIPS' 4

LOCAL BOOST

- **₹22,880 crore:** Outlay of IT hardware PLI scheme
- **₹4,000 crore:** Total investment the scheme may attract
- **₹3.35 trillion:** Worth of estimated incremental production over six years
- **48%:** Likely increase in local value addition
- **75,000:** Direct jobs may be created on account of the scheme
- **April 2024:** Time by when companies may begin manufacturing



"They (laptop and PC makers) are not concerned (about import licences) at all. They want to build most of the supply chain in India"

ASHWINI VAISHNAW
Union Minister of Communications & IT

HOW DOES THE INCENTIVE WORK

It is a kind of subsidy to the sector

Is a direct payment from the budget to goods made in India	**Amount** varies from sector to sector	**Is based on** disadvantage /disability faced by a sector

Context: In a big win for the government's revised **information technology (IT) hardware production-linked incentive (PLI) scheme,** a total of 32 companies have expressed interest in commencing manufacturing of personal computers (PCs), laptops, tablets, servers, and edge computing devices within the country.

Key Points

- Recently, the Union Cabinet approved the **modified production linked incentive (PLI) scheme for information technology (IT) hardware t**o boost local manufacturing of products like tablets and laptops, and more than doubled its budgetary outlay to ₹ 17,000 crore from the previous provision of ₹ 7,325 crore.
- The revised scheme may **offer incentives of up to 9 per cent** on the incremental sales of tablets, laptops, allinone personal computers, servers, and edge computing devices manufactured in the country to attract investment in the sector.
- The **tenure of the scheme** has been extended to six years from four years announced in 2021.
- Only two of the 14 firms that applied for benefits under the scheme´s earlier version could meet their targets in the first year.

PLI Scheme

- **About**: PLI scheme is an initiative that **provides incentives to domestic industries** to boost local production.
  - Through this scheme the Government aims to **give companies incentives on incremental sales** from products manufactured in domestic units.
  - PLI has been introduced to boost domestic manufacturing and **cut down on import bills.**
- **Eligibility**: A **company registered in India** that proposes to produce items related to the Target Segments there and submits an application for approval under the Scheme is an applicant for the purposes of the Production Linked Incentives Scheme.
  - The applicant is **permitted to run either brand-new or current production facilities** to produce goods for the Target Segments.
- **Sectors Included:** Automobile and auto components, electronics and IT hardware, telecom, pharmaceuticals, solar modules, metals and mining, textiles and apparel, white goods, drones, and advanced chemistry cell batteries.
- **Incentives Under the Scheme**: The incentives, **calculated on the basis of incremental sales**, range from as low as 1% for the electronics and technology products to as high as 20% for the manufacturing of critical key starting drugs and certain drug intermediaries.
  - In some sectors such as advanced chemistry cell batteries, textile products and the drone industry, the **incentive to be given will be calculated on the basis of sales, performance and local value addition** done over the period of five years.

THE HINDU

Page 14

REGULATION OF UCB

(Syllabus: GS Paper 3 - Economy)

RBI's Das flags concerns over a few urban cooperative banks

The Hindu Bureau
MUMBAI

Reserve Bank of India (RBI) Governor Shaktikanta Das said while the Urban Cooperative Bank (UCB) sector showed improved financial performance at an aggregate level in the recent times, concerns and vulnerabilities were seen for certain individual entities.

Without naming the entities, he highlighted the need for the UCBs to strengthen financial and operational resilience to contribute to financial and banking sector stability.

The Governor was addressing a conference of directors on the boards of tier 3 and 4 UCBs here.

Turning to specific expectations from the UCBs, the Governor stressed that



Shaktikanta Das

the quality of governance was the most important aspect in ensuring stability of individual banks and urged the directors to further strengthen governance practices, especially the three supporting pillars of compliance, risk management, and internal audit.

"On the functioning of the boards, the Governor emphasised five aspects – adequate skills and expertise of directors, constitution of a professional board of management, diversity and tenure of board members, transparent and participatory nature of board discussions, and effective functioning of board-level Committees," the RBI said in a statement.

He also reinforced the need for boards' involvement in upholding rigorous credit-risk management, including robust underwriting standards, effective post-sanction monitoring, timely recognition and mitigation of incipient stress, rigorous follow up of large NPA borrowers for effective recovery, and maintaining adequate provisioning.

He also cautioned against using innovative accounting to camouflage the actual financial position.

Context: Reserve Bank of India (RBI) Governor said while the **Urban Cooperative Bank (UCB) sector showed improved financial performance** at an aggregate level in the recent times, concerns and vulnerabilities were seen for certain individual entities.

- He highlighted the **need for the UCBs to strengthen financial and operational resilience** to contribute to financial and banking sector stability.
- Recently, the Reserve Bank has **notified four key measures**, including giving them two years more to meet the priority sector lending targets.

4 key measures for UCBs

- **New branches**: UCBs can now **open new branches up to 10 per cent** (maximum 5 branches) of the number of branches in the previous financial year without prior approval of RBI in their approved area of operation.
  - UCBs have to **get the policy approved** by their board and comply with the Financially Sound and Well Managed (FSWM) Norms.
- **One-Time Settlement**: UCBs can do **One-Time Settlement** at par with commercial banks.
  - Now co-operative banks through board-approved policies may provide **process for technical write-off as well as settlement with borrowers.**
- **PSL Targets:** The RBI has decided to extend the timeline for UCBs to **achieve Priority Sector Lending (PSL)** targets by two years i.e. up to March 31, 2026.
  - The **deadline to achieve PSL target of 60 per cent,** which was March 31, 2023, has also been extended to March 31, 2024.
  - The excess deposits, if any, after clearing the shortfall of PSL during FY 2022-23 will also be **refunded to the UCB.**
- **Nodal officer**: In order to meet the long pending demand of the cooperative sector for closer coordination and focused interaction, the **RBI has notified a nodal officer as well.**

PIB August 31

AATMANIRBHAR BHARAT ROZGAR YOJANA

(Syllabus: GS Paper 3 - Employment)

Aatmanirbhar Bharat Rozgar Yojana (ABRY) Surpasses Employment Generation Target

Context: The Central Government's innovative employment incentive scheme, the **Aatmanirbhar Bharat Rozgar Yojana (ABRY),** has exceeded its initial employment generation goals, showcasing its success in fostering job creation and recovery during the COVID-19 pandemic.

- As of July 31, 2023, the **ABRY has already achieved an enrolment of over 7.58 million new employees,** surpassing its initial employment generation target.

Aatmanirbhar Bharat Rozgar Yojana (ABRY)

- **About**: Launched effectively from **October 1, 2020,** the ABRY was **designed to stimulate the creation of new job opportunities** by extending financial support to employers of establishments registered with the Employees' Provident Fund Organization (EPFO).
  - Under this, Government of India will **provide subsidy for two years** in respect of new employees engaged on or after 1st October, 2020 and up to 30th June, 2021.
  - Government will **pay both 12% employees' contribution and 12% employers' contribution** i.e. 24% of wages towards EPF in respect of new employees in establishments employing upto 1000 employees for two years.
  - Government will **pay only employees' share of EPF contribution** i.e. 12% of wages in respect of new employees in establishments employing more than 1000 employee for two years.
- **Beneficiaries:**
  - An **employee drawing monthly wage of less than Rs. 15000/-** who o was not working in any EPFO registered establishment and did not have a Universal Account Number (UAN) prior to 01st October, 2020 who joins employment in any establishment on or after 01.10.2020 up to 31.03.2022 and who is allotted Aadhaar validated UAN.
  - Any EPF member, already allotted with UAN, who made **exit from employment** during the period from 01.03.2020 to 30.09.2020 (Covid Pandemic) from any establishment and who joins in any establishment on or after 01.10.2020 and up to 31.03.2022.
  - The **incentive is payable by the Central Government** by upfront credit in the UANs of the new employees.
- **Eligibility criteria for Establishments**: Establishments registered with EPFO if they add new employees compared to reference base of employees as in September, 2020 as under:
  - minimum of two new employees if **reference base is 50 employees or less.**
  - minimum of five new employees if **reference base is more than 50 employees.**

AUCTIONING OF CRITICAL MINERAL

(Syllabus: GS Paper 3 - Infrastructure)

Critical mineral blocks auction in four months

Bloomberg
feedback@livemint.com

The Union government is preparing to start the auction process for some 100 critical mineral blocks in the next four months, as part of plans to secure domestic supplies of the raw materials needed to fuel the green energy transition.

The blocks are for minerals including nickel, lithium, cobalt and platinum, along with rare earths, mines secretary Vivek Bharadwaj said in an interview.

"The legal framework has been laid out and the blocks have been identified," Bharadwaj said. The tender seeking bids is expected to be out by December and auctions may start three months later.

India is racing to ensure critical minerals security to power its ambition to make the country a key battery and electric vehicles manufacturing hub and help attain a net zero goal. India currently doesn't mine key materials like lithium, cobalt and nickel locally.

In order to incentivize global and local miners to participate in the process, the government is planning to reimburse half the cost of exploration, Bharadwaj said. Companies may take at least three years to bring the mines into operation.

The government changed its mining rules last month in a bid to boost exploration of some critical minerals like lithium by allowing private miners to search for the materials. The reforms will be key for auctioning lithium blocks identified in Jammu and Kashmir, and Karnataka.

India is racing to ensure critical minerals security to make the country a key battery and EV hub

Some state-run companies have been scouring the globe for such assets while heavyweights Coal India Ltd. and NTPC Ltd. are mapping out plans to mine the materials. Khanij Bidesh India Ltd, a joint venture of three government-run firms, has been created to purchase critical mineral assets overseas, mainly in Australia and South America.

Context: The Union government is preparing to start the **auction process for some 100 critical mineral blocks** in the next four months, as part of plans to secure domestic supplies of the raw materials needed to fuel the green energy transition.

- The blocks are for minerals including **nickel, lithium, cobalt and platinum, along with rare earths.**
- The **legal framework** has been laid out and the blocks have been identified.

Recent amendments

- Recently, the union cabinet approved amendments to the **Mines and Minerals (Development and Regulation) Act** allowing commercial mining of lithium and a few other minerals.
- The development comes just weeks after a committee set up by the Union ministry of mines declared **30 minerals as 'critical' for the country,** including these six minerals.
- **Critical minerals** refer those that are at risk of supply shortage, which may have a larger impact on the economy compared to that of other raw materials.
- The amendments will **lift the ban on commercial mining of six critical minerals** - lithium, beryllium, titanium, niobium, tantalum and zirconium.
- All of **India's lithium requirement** is imported from countries such as Chile, Russia, China, Ireland and Belgium.
- **Beryllium** is sourced from Russia, the UK, Netherlands, South Africa and China.
- So far, most of the exploration in the country has been focussed on **bulk commodities like limestone, coal and iron ore.**
- With new requirements in **technology and energy transition**, there is a growing demand for these critical minerals, prompting the government to focus on the exploration of deep-seated and critical minerals.
- Among these minerals, the **demand for lithium** has grown manifold in the past few years, as the focus has shifted towards electric mobility and grid scale battery storage amid India's energy transition.
- The government has also come up with a **production-linked incentive scheme** for advanced chemistry cells.
- Another for **niche batteries** manufactured with newer chemistries is also in the works.
- The **Geological Survey of India** has found the presence of significant lithium reserves totalling 5.9 million tonnes in Reasi district of Jammu and Kashmir. Another reserve has been found in Rajasthan.

PIB August 31

KOLKATA METRO RAILWAY

(Syllabus: GS Paper 3 - Infrastructure)

Kolkata Metro Railway is set to become member of elite club of London, Moscow, Berlin, Munich, and Istanbul Metro

Context: Kolkata Metro Railway has now decided to use **composite Aluminium Third Rail in all the upcoming corridors** being undertaken for construction along with retro fitment in existing corridor with steel Third Rail.

- With this Metro Railway, **Kolkata would become the member of elite club of London,** Moscow, Berlin, Munich, and Istanbul Metro who have also shifted from steel Third Rail to Aluminium Third Rail.

Key Points

- Kolkata Metro Railway, **India's first Metro built by Indian Railways** on 24th October 1984, has been serving as a lifeline for Kolkata, the city of Joy for nearly 40 long years.
- In Kolkata Metro Railway, the power to Metro Rake is supplied to rolling stock at 750V DC through steel Third Rail.
- The **Third Rail Current Collector (TRCC)** made of steel fitted on metro rake collects the current from Third Rail.
- Kolkata Metro Railway **using steel Third Rail** for the last 40 years.
- **Advantages of aluminium composite Third Rail over steel Third Rail are as under :**
  - **Reduction in resistive current loss and improved Traction voltage level** as the resistance of steel Third Rail is around six times higher than composite Aluminium Third Rail.
  - On an average, for 10 km corridor with **use of Aluminium composite Third Rail** would require 01 no. less Traction Substation compared to steel Third Rail i.e. a straight saving of approx.₹210 Crores capital investment for a 35 km of Metro corridor.
  - The **reduced voltage drop shall facilitate achieving faster acceleration** with the same rake available with Kolkata Metro Railway.
  - **Reduced maintenance and life cycle cost.** The requirement of painting of Third Rail every 5 years may not be needed anymore. The frequency of measurement of Third Rail dimension may reduce significantly. There may be no possibility of damage due to rusting etc
  - **Improvement in the efficiency** of train operations.
  - **Huge improvement in Energy Efficiency** and reduction in carbon footprint.
  - **Estimated energy saving using composite Aluminium Third Rail** may be approximately 6.7 million units per annum.
  - Improved headway of the trains.

ECONOMIC TIMES

Page 2

LADAKH ISSUE

(Syllabus: GS Paper 2 - Polity)

Will Continue to Fight for Statehood: Leh, Kargil Bodies

HakeemIrfan.Rashid
@timesgroup.com

Srinagar: The Leh Apex Body (LAB) and Kargil Democratic Alliance (KDA) on Wednesday said that no one has the right to snatch legislative powers from the people of Ladakh and they will continue to strive for statehood and the implementation of Sixth Schedule in the newly-formed Union territory.

Sajjad Kargili of KDA said: "If the government fails to provide good governance to the people of Ladakh, then why was the decision made to separate us from the erstwhile state of J&K? We were previously benefiting from representation, special status and statehood. Currently, our youth are grappling with unemployment, and our voice within the UT remains unheard. There is no democracy."

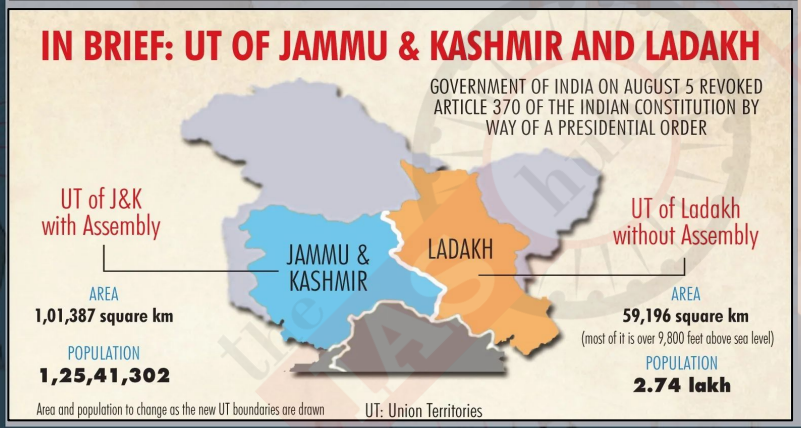
LAB and KDA — an amalgam of religious, social and political organisations in the UT — have stated that the people of Ladakh should have the right to run the region. They reiterated the demand for statehood, Sixth Schedule, two Lok Sabha seats for Leh and Kargil and a separate Public Service Commission for Ladakh, to ensure employment for the residents of Ladakh.

"The people of Ladakh should have legislative powers. We want to safeguard our land, culture, jobs and identity. GoI should have made it clear in the submission before the Supreme Court, during the hearing (of the petitions regarding Article 370)," said Tsering Namgyal, member of LAB.

Earlier this week, during the hearing on abrogation of Article 370 in the Supreme Court, the Solicitor General of India had stated that Ladakh would remain a UT.

NEED LEGISLATIVE POWER

People of Ladakh must have legislative powers. We want to safeguard our land, culture, jobs: Tsering Namgyal, LAP member



Context: The **Leh Apex Body (LAB) and Kargil Democratic Alliance (KDA)** said that no one has the right to snatch legislative powers from the people of Ladakh and they will continue to strive for statehood and the **implementation of Sixth Schedule in the newly-formed Union territory.**

Demand proposed by Ladakh

- The Leh Apex Body (LAB) and the Kargil Democratic Alliance (KDA) has jointly put forward a four-point agenda to drive the agitations in the UT of Ladakh as follows:
  - **Statehood for Ladakh**
  - **Safeguards under the Sixth Schedule of the Constitution**
  - **Formation of Public Service Commission and job reservation for Ladakh youth**
  - **Creation of two separate parliamentary constituencies for Leh and Kargil**
- The LBA's **demand for statehood** marks a sharp departure from the long-held position of Ladakhi Buddhists to be governed directly by the central government.
  - This is because after Ladakh was declared a UT, people claimed to have **lost constitutional protection on land, employment and democratic decision-making.**
- The LBA and KDA leaders complained that the **new UT administration, governed by bureaucrats appointed by Centre** has hijacked the space for political consultation and consent.
- The demand from the local tribal communities in Ladakh is to extend the **provisions of the Sixth Schedule to the region.**
- This was primarily driven by concerns over the **protection of tribal rights** and the preservation of the unique cultural identity of the local communities.

Current administration in Ladakh

- **Ladakh was granted Union Territory status in 2019**, following the bifurcation of the state of Jammu and Kashmir into two separate Union Territories.
- The administration of Ladakh is currently **governed by the Lieutenant Governor of Ladakh** and an elected Ladakh Autonomous Hill Development Council (LAHDC).

DTE

August 31

ADDIS ABABA DECLARATION

(Syllabus: GS Paper 3 - Env & Eco)



Over 50 African countries agree to work on minimising impact of mineral mining

Addis Ababa declaration signed by 54 nations; acknowledge green challenges of land degradation, desertification and drought

NEXT NEWS >

By Kiran Pandey
Published: Monday 28 August 2023



Context: Environment ministers of the **African continent have agreed to institute national and regional strategies** to minimise environmental impacts in the extraction and processing of critical mineral resources.

- Fifty-four countries acknowledged key environmental challenges faced by the continent - land degradation, desertification and drought - in the **Addis Ababa declaration,** August 18, 2023.
- The declaration was a key outcome of the **19th African Ministerial Conference on the Environment (AMCEN) 2023** held from August 14 to 18, 2023 at Addis Ababa, Ethiopia.
- The theme for AMCEN 2023 was **"Seizing Opportunities and Enhancing Collaboration to Address Environmental Challenges in Africa".**

Addis Ababa declaration

- The declaration **prioritises urgent, wide-ranging action on environmental challenges** related to climate change, plastics pollution, marine protection, biodiversity conservation and natural capital.
- These actions would **minimise environmental impacts and contribute** to the global goals of mitigating climate change, protecting ecosystems and promoting sustainable development.
- The countries also **committed to take appropriate measures to implement the Kunming-Montreal Global Biodiversity Framework** through updating or revising national biodiversity strategies and action plans or national targets.
- The ultimate aim is to **increase the global finance flow** to at least $100 billion per year, stated the declaration.
- The countries have also agreed to work on a priority to implement **Africa Blue Economy Strategy** of the African Union.

DTE

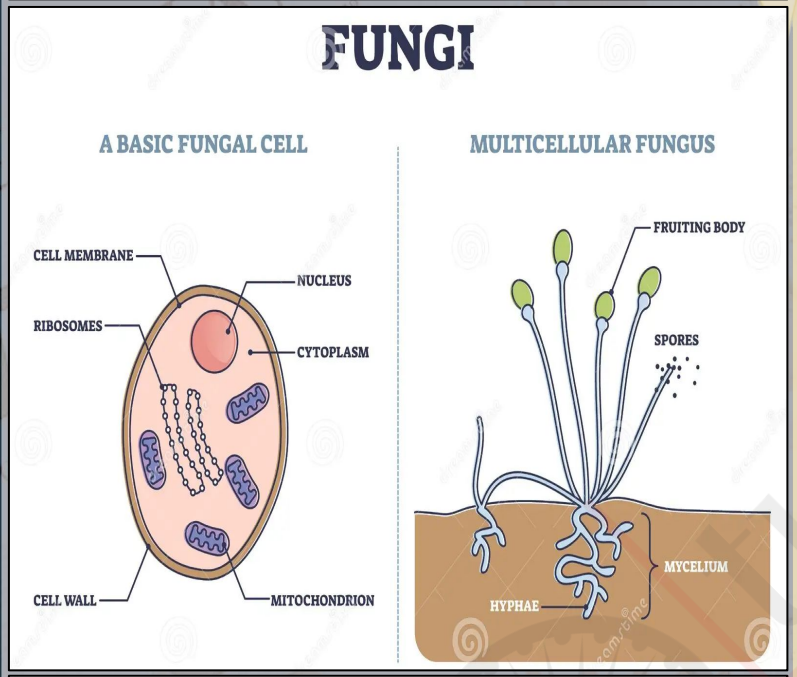
August 31

FUNGI AND FUNGA

(Syllabus: GS Paper 3 - General Science)

Funga: UN wants us all to say it along with 'Flora & Fauna'

The global organisation says it is time that fungi are recognised and protected equally with plants and animals



Difference Between Algae and Fungi	
Algae	**Fungi**
The term originated from Latin and it means **"Seaweed"**	Originated in Latin and it means **"mushroom"**
Algae belong to the Kingdom Protista	Fungi were once classified under Kingdom Protista, but are now classified under their own kingdom – Fungi
Algae are autotrophic organisms	Are usually heterotrophic. They prefer dead organic matter.
Strictly exists in bodies of water or any environment with high moisture content	Found almost everywhere, including deserts and frigid environments
Are not parasitic	Some members are parasitic

Context: United Nations Biodiversity has urged people globally to **use the word 'funga'** whenever they say 'flora and fauna', in order to highlight the importance of fungi.

Key Points

- **Fungi**, along with Animalia (animals), Plantae (plants), Protista, Archaea/Archaebacteria, and Bacteria or Eubacteria form the six 'kingdoms' of biology.
- This is not the first time when a request has been made to include fungi along with flora and fauna.
- Two years ago, the **Species Survival Commission (SSC) of the International Union for Conservation of Nature (IUCN)** announced that it would use "mycologically inclusive" (referring to fungi) language in its internal and public-facing communications ("fauna, flora and funga" and "animals, fungi and plants") and to incorporate fungi in conservation strategies with rare and endangered plants and animals.

Fungi

- Fungi are **eukaryotic organisms** that include microorganisms such as yeasts, moulds and mushrooms.
- The organisms **found in Kingdom fungi** contain a cell wall and are omnipresent.
- They are classified as **heterotrophs** among the living organisms.
- Almost all the fungi have a **filamentous structure** except the yeast cells.
- Fungi possess a **cell wall** which is made up of chitin and polysaccharides.
- The cell wall comprises a **protoplast**, which is differentiated into other cell parts such as cell membrane, cytoplasm, cell organelles and nuclei.
- Fungi **lack chlorophyll** and hence cannot perform photosynthesis.
- Fungi store their food in the form of starch.
- **Examples** include mushrooms, moulds and yeast.

DST

August 31

CATHODE MATERIALS FOR SODIUM ION BATTERIES

(Syllabus: GS Paper 3 - Sci & Tech)

Newly synthesised cathode materials for sodium ion batteries promises cost-effective and sustainable energy storage

Context: Scientists have developed **sodium nickel manganese cobalt oxide and sodium nickel manganese iron oxide (Na-NMC and NFM) cathode materials** along with novel sodium superionic conducting solid-state electrolytes designed specifically for sodium ion batteries.

- The developed cylindrical cells and the resultant battery pack, has been **developed under Ministry of Higher Education (MHE) and Science and Engineering Research Board (SERB)**, a statutory body under the Department of Science and Technology, supported IMPRINT II project.

Key Points

- The newly developed cathode materials can **provide high capacity and prolonged battery life**, enabling longer-lasting and more powerful sodium ion batteries.
- The **novel sodium superionic conducting solid-state electrolytes** play a crucial role in efficiently transporting sodium ions within the battery.
- This breakthrough could enhance the battery's safety, stability, and energy density.
- A **compatible battery management system (BMS)** and suitable charger were developed by the industry collaborator.
- **Sodium ion batteries,** which utilise sodium ions as charge carriers instead of lithium ions, offer numerous advantages over traditional lithium-ion batteries. Important among these advantages are lower costs, abundance and chemistry of sodium ion batteries similar to lithium.
- Additionally, **sodium's wider availability** and reduced environmental impact make sodium ion batteries a more sustainable choice.
- However, **safety, stability and energy density** of these batteries are challenges which need to be addressed.

Lithium-ion battery	Sodium-ion battery
• Sodium is more than 500 times more abundant than lithium. It can also be extracted from seawater at a low cost.	• Lithium availability is limited to a few countries, which is why prices have risen more than seven-fold since 2021.
• Sodium is more environmentally friendly and can be transported at zero volt, making it safer.	• Lithium is less environmentally friendly than sodium and must be always stored with a minimum charge, increasing fire risks.
• A Sodium-ion battery uses aluminum which is cheaper than copper.	• Lithium-ion battery uses copper, which is three or four times more expensive than aluminum used on sodium batteries
• Sodium-ion battery has a higher operating temperature range. This means these can be used in more extreme temperatures without the risk of thermal runaway.	• Lithium-ion battery has lower operating temperature range and can cause fire if operated in higher temperatures.
• Sodium-ion battery charges faster than lithium-ion variants and have a three times higher lifecycle.	• Lithium-ion battery has a slow charge rate and smaller lifecycle compared to sodium-based batteries.

Secure Top Rank with theIAShub Courses

Prelims 2023 Courses

01 Prelims Crash Course Score Enhancement Program (SEP)

02 INA Current Affairs (Prelims)

03 TACKLE - Prelims Test Series

04 Geography - Prelims Crash Course

Quality Enrichment Courses (Mains 2023)

01 Quality Enrichment Program (QEP)

02 Science of Answer Writing (SAW)

Prelim Cum Mains 2024 Courses

01 NEEV GS Foundation 2024/25

02 INA Current Affairs Pre Cum Mains - 2024

FREE Download PDF

Login to theiashub.com

- Aaj Ka Quality Enrichment (Toppers' Favourite PDF)
- News-CRUX-10 (10 News. 10 Sources. One Place)
- Monthly Editorials (The Hindu & Indian Express)
- Daily Quiz (Prelims)
- Government Schemes & Ministry Wise Year End Review
- Free Enrichment PDFs (Tailor Made Crisp Study Material)



Log On To Our Unique
Free Answer Writing Sessions with Toppers (FAST) Portal
& Start Practicing!

SCAN HERE

9560082909

t.me/theiashub

/mkyadav

www.theiashub.com

www.theiashub.com