



Schemes Approved in Budget 2024-25

For Prelims: [Fertiliser \(Urea\)](#), [AatmaNirbhar Bharat](#), Key Schemes Approved by Union Government, Antyodya Anna Yojana (AAY).

For Mains: Key Schemes Approved by Union Government, Government Policies & Interventions.

Source: [PIB](#)

Why in News?

Recently, the Union cabinet has approved a slew of key economic decisions, including extension of various schemes such as Extension of Subsidised Sugar Scheme among others.

What are the Key Schemes Approved by the Union Government?

- **Extension of Subsidised Sugar Scheme:**
 - The Cabinet extended the scheme to distribute subsidised sugar to **Antyodya Anna Yojana (AAY)** families for two more years till 31st March 2026.
 - The Scheme facilitates **access to sugar to the poorest** of the poor and adds energy to their diet so that their health improves.
 - Under the Scheme, the Central Government gives subsidies of **Rs.18.50 per kg per month** of sugar to AAY families of participating States.
 - The approval is expected to extend benefits of more than Rs.1850 crore during the period of [the 15th Finance Commission \(2020-21 to 2025-26\)](#).
 - The Government of India is already giving free ration under [Pradhan Mantri Garib Kalyan Anna Yojna \(PM-GKAY\)](#).
 - Selling '[Bharat Atta](#),' 'Bharat Dal,' tomatoes, and onions at affordable and fair prices are measures to ensure an adequate food supply for citizens, **extending beyond the PM-GKAY program**.
 - With this approval, the Government will continue giving subsidies to participating States for the distribution of sugar to AAY families through [PDS \(Public Distribution System\)](#) at the rate of One kg per family per month.
 - States have the responsibility to procure and distribute sugar.
- **Continuation of Scheme for Rebate of State and Central Taxes and Levies (RoSCTL) for export of Apparel/Garments:**
 - The Cabinet **approved the continuation of a scheme granting a rebate** on state and central taxes and levies for the export of apparel and garments up to 31st March 2026.
 - The continuation of this scheme for two more years is expected **to provide a stable policy regime for long-term trade planning**, particularly in the textiles sector.
 - Other textile products not covered under the RoSCTL are eligible to avail benefits under [RoDTEP](#) along with other products.
- **Extension of Animal Husbandry Infrastructure Development Fund (AHIDF):**
 - The Cabinet approved an extension of the **AHIDF** to be implemented under the **Infrastructure Development Fund (IDF) for another three years, up to 2025-26**.
 - The scheme aims to incentivize **investments in dairy processing, product**

- diversification, meat processing, animal feed plants, and breed multiplication farms.**
- The AHIDF is a scheme aimed to promote and **incentivize investments in the animal husbandry sector in India.**
 - The Government of India will provide **3% interest subvention for 8 years with a two-year moratorium for loans** up to 90% from scheduled banks and other financial institutions.
 - **Marketing Margin for Supply of Domestic Gas to Fertiliser Units:**
 - The Cabinet approved a formula for the **determination of marketing margin on the supply of domestic gas to Fertiliser (Urea)** units from 1st May 2009 to 17th November 2015.
 - This approval is a structural reform. Marketing Margin is charged by gas marketing companies **from consumers over and above the cost of gas** for taking on the additional risk and cost associated with marketing of gas.
 - Government had previously determined the marketing margin on supply of domestic gas to urea and **LPG producers in 2015.**
 - The approval will provide additional capital to the various Fertilizer (Urea) Units for the component of marketing margins paid by them on domestic gas procured between 2009 to 2015.
 - In line with government vision of **AatmaNirbhar Bharat**, this approval will incentivize manufacturers to increase investment.
 - The increased investment will lead to self-sufficiency in fertilizers, and provide an element of certainty for future investments in the gas infrastructure sector.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims

Q. With reference to the provisions made under the National Food Security Act, 2013, consider the following statements: (2018)

1. The families coming under the category of 'below poverty line (BPL)' only are eligible to receive subsidised food grains.
2. The eldest woman in a household, of age 18 years or above, shall be the head of the household for the purpose of issuance of a ration card.
3. Pregnant women and lactating mothers are entitled to a 'take-home ration' of 1600 calories per day during pregnancy and for six months thereafter.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 only
- (c) 1 and 3 only
- (d) 3 only

Ans: (b)

Mains

Q.1 In what way could replacement of price subsidy with Direct Benefit Transfer (DBT) change the scenario of subsidies in India? Discuss. **(2015)**

Q.2 What are the salient features of the National Food Security Act, 2013? How has the Food Security Bill helped in eliminating hunger and malnutrition in India? **(2021)**

MEA's Development Aid

For Prelims: [Interim Budget 2024-25](#), India's 'Neighbourhood First' policy, [Mangdechhu Hydroelectric Power Project](#), [Kholongchu HEP](#), [Buddhism](#)

For Mains: India-Bhutan Relations, India and its neighbourhood- relations, Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.

[Source: IE](#)

Why in News?

In the recently announced [Interim Budget for the fiscal year 2024-25](#), the **Ministry of External Affairs (MEA)** has outlined its development assistance plans, focusing on strategic partners and neighbouring countries.

- The MEA's development aid is geared towards **expanding and safeguarding India's global influence and interests**, aligning with foreign policy goals. Additionally, the objective includes **promoting regional connectivity, cooperation, and stability through strategic development assistance**.

How is the Development Aid Distributed Among Countries?

- The ministry allocated a total of Rs 22,154 crore for the 2024-25 fiscal year in the Interim budget as against last year's outlay of Rs 18,050 crore.
 - In line with [India's 'Neighbourhood First' policy](#), the **largest share** of the aid portfolio has been **granted to Bhutan with an allocation of Rs 2,068 crore** against Rs 2,400 crore in 2023-24.
 - [Bhutan](#) emerges as the frontrunner, receiving a substantial share of the aid portfolio.
 - The development assistance to the [Maldives](#) has been kept at **Rs 600 crore** as against last year's Rs 770 crore, according to budget papers.
 - In continuation with India's special relationship with the people of [Afghanistan](#), a **budgetary aid of Rs 200 crore** has been set aside for the country.
 - An amount of **Rs 120 crore will be provided to [Bangladesh](#)** under development aid while [Nepal](#) would be provided Rs 700 crore.
 - [Sri Lanka](#) will get development aid worth Rs 75 crore, [Mauritius](#) to receive Rs 370 crore while the amount for [Myanmar](#) has been pegged at Rs 250 crore.
 - A separate amount of **Rs 200 crore has been set aside for African countries**.
 - The total development assistance to various countries and regions such as **Latin America and Eurasia** has been pegged at Rs 4,883 crore.
 - The allocation for [Chabahar Port](#) has also been maintained at **Rs 100 crore**, underlining India's focus on connectivity projects with Iran.

What are the Other Development Partnerships of MEA?

- **Humanitarian Assistance:**
 - The MEA extends **humanitarian assistance to partner countries** in times of **natural disasters**, emergencies, and **pandemics**.
 - India has provided relief supplies, medical teams, and financial assistance to several countries and also supplied medicines, vaccines, and medical equipment to over 150 countries to combat the [Covid-19 pandemic](#).
- **Cultural and Heritage Cooperation:**

- The MEA promotes cultural and heritage cooperation with partner countries. India's assistance programme more than **50 cultural and heritage projects have been completed**, including the restoration of **Ananda Temple; Shwedagon Pagoda (Myanmar)**, Indian Gallery at **Sacred Tooth Relic Temple, Kandy (Sri Lanka)**, renovation of **BalaTiripuraSundari Temple; construction of [Dharamshalas-Pashupathinath temple \(Nepal\)](#)**.
 - Currently around **25 cultural and heritage projects are under implementation in various countries.**
- **Capacity Building and Technical Assistance:**
 - India's development partnership prioritises **capacity building, offering civilian and military training, on-site programs**, and expert deputation to friendly nations.
 - The **[Indian Technical and Economic Cooperation \(ITEC\) program](#)**, initiated in 1964, spans 160 partner countries, providing **short-term training across diverse disciplines**, witnessing significant growth from 4,000 to 14,000 slots by 2019-20.
 - Courses cover areas such as Engineering, Climate Change, Health, and Women Empowerment, contributing to holistic skill enhancement globally.
- **Lines of Credit for Development Projects:**
 - Development assistance in the **form of concessional [Lines of Credit \(LOCs\)](#)** is extended by India under the **Indian Development and Economic Assistance Scheme (IDEAS)** through the **[Exim Bank of India](#)**.
 - In total 306 LOCs worth USD 30.59 billion have been extended to 65 countries. The projects under the LOCs cover critical infrastructure sectors such as transport, power generation; agriculture; manufacturing industries, healthcare, education and capacity building.

Why is Bhutan Important for India?

- Bhutan serves as a **buffer state between India and China**, two Asian giants with complex relations. Bhutan's strategic location provides India with an **additional layer of security** against potential threats from the north.
- In 2017, during the **[Doklam standoff between India and China](#)**, Bhutan played a crucial role in **allowing Indian troops to enter its territory to resist Chinese incursions.**
- India's full support for the socio-economic development of Bhutan is based on its priorities to boost **cross-border connectivity** and expand ties in trade, infrastructure and energy.
- The Government of India has committed Rs. 45 billion to **Bhutan's 12th Five Year Plan (2018-2023)**, which includes Rs. 28 billion for **Project Tied Assistance (PTA)**.
 - The **PTA program includes projects in various sectors**, including health, education, culture, livestock development, and infrastructure.
- For grassroots development across Bhutan, India has committed to the **High Impact Community Development Projects (HICDPs)/Small Development Projects (SDPs)**.
 - These are **short gestation small projects** situated in remote parts of Bhutan for the creation of infrastructure such as Farm Roads, livestock centres, water supply and irrigation systems and capacity development at a local level.
- Mutually beneficial **[hydro-power cooperation with Bhutan](#)** is a key pillar of bilateral economic cooperation. For Bhutan, **hydro-power development** continues to be a **vital catalyst for socio-economic development.**
- The ongoing cooperation between India and Bhutan in the hydro-power sector is covered under the 2006 bilateral agreement for cooperation and its Protocol signed in 2009.
 - Four hydroelectric projects (HEPs) totalling 2136 MW are already operational in Bhutan and are supplying electricity to India.
 - The **720 MW Mangdechhu** was commissioned in August 2019 and handed over to Bhutan in December 2022.
 - Two HEPs namely, 1200 MW **Punatsangchhu-I**, and 1020 MW **Punatsangchhu-II** in Inter-Governmental mode are under various stages of implementation.
 - The two countries commissioned the first-ever joint venture project the **600 MW [Kholongchhu hydropower project](#)**. The project is aimed at generating surplus hydroelectricity for Bhutan which will be exported to India aiding Bhutan's revenue as well as employment generation.
- **India is Bhutan's top trade partner** both as an import source and as an export destination.

- The two neighbours have a close civilisational, cultural relationship that dates back centuries. **Bhutan considers India as gyagar**, meaning the holy land, as [Buddhism](#) originated in India, which is the religion followed by the majority of Bhutanese.

India's Neighbourhood First Policy

- India's '**Neighbourhood First Policy**' guides its approach towards the management of relations with countries in its **immediate neighbourhood**, that is, **Afghanistan, Bangladesh, Bhutan, Maldives, Myanmar, Nepal, Pakistan and Sri Lanka**.
- The Neighbourhood First policy, inter alia, is aimed at **enhancing physical, digital and people-to-people connectivity** across the region, as well as augmenting trade and commerce.

UPSC Civil Services Examination, Previous Year Questions (PYQ)

Mains

Q. Evaluate the economic and strategic dimensions of India's Look East Policy in the context of the post-Cold War international scenario. **(2016)**

Guidelines on State Guarantees on Borrowings

For Prelims: RBI's Guidelines on State Guarantees on Borrowings, [Reserve Bank of India \(RBI\)](#), [Indian Contracts Act, 1872](#).

For Mains: RBI's Guidelines on State Guarantees on Borrowings.

[Source: TH](#)

Why in News?

Recently, a Working Group constituted by the [Reserve Bank of India \(RBI\)](#) has made certain recommendations to address issues relating to **Guarantees extended by State governments**.

- The Working Group constituted during the 32nd Conference of the State Finance Secretaries held in July 2022.

What Constitutes a Guarantee?

- **About:**
 - A 'guarantee' is a legal obligation for a State to make payments and protect an **investor/lender from the risk of default by a borrower**.
 - A guarantee, as per the [Indian Contracts Act, 1872](#), is a contract to "perform the promise, or discharge the liability, of a third person in case of his default. It involves three parties: **the principal Debtor, Creditor, and Surety**.
 - **Creditor:** The entity to whom the guarantee is given. This is the party to whom the

payment is due, and they are protected by the guarantee.

- **Principal Debtor:** The entity on whose **behalf the guarantee is given**. This is the **party that owes a debt** or has a liability.
- **Surety:** The **entity providing the guarantee** (State governments in this context), that **promises to perform the promise** or discharge the liability of the **principal debtor in case of default**.

- The surety undertakes a legal obligation to perform the promise or discharge the liability of the **principal debtor if they default**.

- A guarantee must not be confused with an **'Indemnity'** contract that protects the lender from loss caused to them by the conduct of the promisor (or the principal debtor).

▪ **Illustration:**

- If **A delivers** certain goods or services to B and B does not make the **agreed-upon payment**, B is defaulting and at the risk of being sued for the debt.
- C steps in and promises **that s/he would pay for B**. A agrees to the forbear request. C's action constitutes a guarantee.

▪ **Purpose of a Guarantee:**

- At the state level, guarantees are commonly used in three situations.
 - **Seeking Concessional Loan:** When **seeking concessional loans** from bilateral or multilateral agencies for public sector enterprises, a **sovereign guarantee** is often required.
 - **To Enhance the Viability of Projects:** Guarantees are employed to enhance the viability of projects that **promise significant social and economic benefits**.
 - **To Secure Resources at Lower Interest:** Public sector enterprises may use guarantees to secure resources at lower interest rates or more favourable terms.

▪ **Risk With the Guarantees:**

- The use of guarantees, while convenient in good times, poses **fiscal risks**.
- According to the report by the working group, one of the reasons why the instrument has been widely used is that an **upfront cash payment is usually not required in case of guarantees**.
- This **practice can lead to unforeseen cash outflows and increased debt for the state**, especially as guarantee triggers and associated costs are often challenging to estimate.
- State governments are **often obligated to grant guarantees on behalf of various entities** like state-owned enterprises, cooperative institutions, and urban local bodies **to secure loans from commercial banks** or financial institutions.
 - In return, these entities **pay a guarantee commission or fee to the state government**.

What are the Key Recommendations of the RBI Working Group Regarding Guarantee?

▪ **Definition of Guarantee:**

- The term Guarantee should be **used in a broader sense** and include all instruments **if they create an obligation on the guarantor (State) to make a payment on behalf of the borrower** at a future date.
- Further, it must **make any distinction between conditional or unconditional, or financial or performance guarantees** in order to assess the fiscal risk.
 - These are conditional liabilities that may present a **potential risk in the future**.

▪ **Guarantees only for the Principal Loan:**

- The government guarantees **should not be used to obtain finance** through State-owned entities, which substitute budgetary resources of the State Government.
 - Additionally, they should not be allowed to **create direct liability/de-facto liability on the State**.
- There should be **adherence to Government of India guidelines** that stipulate that **guarantees be given only for the principal amount** and normal interest component of the underlying loan.
- Guarantees must not be extended for **External Commercial Borrowings**, must not be extended for **more than 80% of the project loan** (depending on the conditions imposed by the lender) and must not be provided to private sector companies and institutions.

- Appropriate preconditions such as the **period of guarantee, levy of (guarantee) fee to cover risk, government representation on the management board of the borrowing entity,** and right to audit, etc, must be specified.
- **Risk Determination, Fee and Ceiling:**
 - The Group recommends that **States assess the risk associated with guarantees** by categorising them **as high, medium, or low risk,** taking into account the **entity's past default history.**
 - The methodology used for assigning these risk weights should be transparent and disclosed.
 - Based on the risk assessment **minimum guarantee fee must be set at a minimum of 2.5% per annum.**
 - The report emphasises that **invoking a guarantee could impose considerable fiscal strain** on the state government.
 - To mitigate potential stress, the Group proposes **imposing a ceiling on guarantees,** limiting them **to 5% of [Revenue Receipts](#) or 0.5% of [Gross State Domestic Product \(GSDP\),](#) whichever is lower.**
- **Disclosures & Honouring Commitments:**
 - The Group recommends that the RBI should suggest **banks/NBFCs to disclose the credit given to State-owned entities with State-government guarantees.**
 - The report emphasises the **need for a comprehensive database to track extended guarantees,** proposing the creation of a unit at the State level for this purpose.
 - Acknowledging potential risks, the report highlights that **delays in honoring guarantees could harm the State government's reputation** and pose legal risks.
 - It advises **States to be cautious when providing finance to entities** with a history of not meeting commitments.
 - Additionally, the report emphasizes the **importance of promptly honoring guarantees to maintain credibility** with lenders and investors.

What are the Different Guarantees Given by the Government?

- **Guarantees given to RBIs,** other banks and Financial Institutions (like [IFCI, LIC, UTI](#) etc) **for repayment of principal and payment of interest,** cash credit facility, financing seasonal agricultural operations, and for providing working capital in respect of companies, corporations, cooperative societies and cooperative banks.
- Guarantees given in pursuance of agreements entered into by the **Government of India with International Financial Institutions** towards repayment of principal, payment of interest etc.
- **Counter-Guarantees to Banks in consideration of the Banks having issued Letters of Authority to Foreign Suppliers** for Supplies/Services made/rendered by them on credit basis, in favour of the Companies/Corporations.
- **Guarantees given to Railways/State Electricity Boards** for due and punctual payment of dues/freight charges by Companies/Corporations. **(Nil for past few years)**
- **Performance guarantees given for fulfilment of contracts/projects** awarded to Indian companies or Foreign companies in foreign countries. (Nil for past few years)

Nano DAP

For Prelims: [Interim Budget 2024-25](#), Nano Fertilizer, [Indian Farmers Fertiliser Cooperative \(IFFCO\)](#).

For Mains: Nano DAP, Issues Related to Using Nano DAP.

Why in News?

Recently, the Finance Minister in the [Interim Budget 2024-25](#) has announced the expansion of the application of **Nano DAP (Di-Ammonium Phosphate)** as a [Fertilizer](#) on various crops in all agro-climatic zones.

- Nano fertilisers are **highly efficient types of fertilisers** that provide nutrients like nitrogen to crops through fine granules.

What is Nano DAP?

- **DAP (Di-Ammonium Phosphate):**
 - DAP is the second most commonly used fertilizer in India after urea.
 - DAP is a preferred fertilizer in India because it contains both **Nitrogen and Phosphorus** which are primary macro-nutrients and **part of 18 essential plant nutrients**.
 - Fertilizer grade DAP **contains 18% Nitrogen and 46% Phosphorus**. It is manufactured by **reacting Ammonia with Phosphoric acid** under controlled conditions in fertilizer plants.
- **Nano DAP:**
 - **Nano DAP is a specialised form of DAP** designed with the goal of improving the fertiliser's effectiveness in promoting plant growth and development.
 - In 2023 [Indian Farmers Fertiliser Cooperative \(IFFCO\)](#) launched its Nano DAP, containing **8% Nitrogen and 16% Phosphorus by volume**.
 - Unlike conventional DAP, which comes in granular form, IFFCO's Nano **DAP is in liquid form**.

Primary Macro-nutrients Essential for Plant Growth

Nutrient	Contribution to Plant Growth
Nitrogen	Essential for leaf and stem growth , protein synthesis, and overall vigour
Phosphorus	Crucial for root development, flowering, fruiting , and energy transfer
Potassium	Aids in overall plant health, stress resistance , and regulation of water
Calcium	Important for cell wall structure, cell division , and enzyme activation
Magnesium	Essential component of chlorophyll, involved in photosynthesis and metabolism
Sulfur	Necessary for protein synthesis, enzyme function , and nutrient uptake
Carbon	Main component of organic molecules, essential for photosynthesis
Hydrogen	Critical for biochemical reactions , water uptake, and maintaining pH
Oxygen	Involved in respiration, energy release, and nutrient transport
Iron	Key for chlorophyll synthesis, electron transfer , and enzyme activation
Zinc	Essential for enzyme function, hormone regulation , and protein synthesis
Manganese	Required for photosynthesis, enzyme activation , and nitrogen metabolism

Copper	Important for enzyme activity, lignin formation , and nutrient uptake
Boron	Facilitates cell division, sugar transport, and hormone regulation
Molybdenum	Needed for nitrogen fixation, enzyme activity , and amino acid synthesis
Chlorine	Involved in photosynthesis, water regulation , and ion balance
Nickel	Required for nitrogen metabolism, enzyme activation , and seed development
Cobalt	Essential for nitrogen fixation, vitamin B12 synthesis , and enzyme activity

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NANO DAP

Nano DAP is a nanotechnology based revolutionary agri input which provides nitrogen and phosphorous to plants. Nano DAP is a sustainable option for farmers towards smart agriculture and to combat climate change. Nano DAP is bio available to plants because of its desirable particle size (<100 nm), more surface area and more particles per DAP prill.

Benefits



What is the Significance of Promoting Nano DAP?

- **More Efficient than Conventional DAP:**
 - This tiny particle, **size less than 100 Nanometre (nm)**, makes Nano DAP **more efficient than its conventional counterpart**, enabling the fertiliser **“to enter easily inside the seed surface** or through stomata and other plant openings”.
 - Better assimilation of the fertiliser inside the plant system in turn leads to **“higher seed vigour, more chlorophyll**, photosynthetic efficiency, better quality and increase in crop yields.”
- **Pocket-Friendly:**
 - It is more pocket-friendly than its conventional counterpart. A 500 ml bottle of Nano DAP, equivalent to a 50-kg bag of conventional DAP, is priced at only Rs 600 (compared to Rs 1,350 for the bag).
 - Since the government provides significant subsidies on DAP, the adoption of a more inexpensive fertiliser will **likely be a significant relief to the government’s subsidy burden**.
- **More Convenient for Farmers:**

- For farmers, Nano DAP is significantly more convenient as it comes in small 500 ml bottles, which are **easier to carry, store, and apply than heavy 50kg bags**.
- To use Nano DAP, farmers simply mix 250-500 ml of it with water and spray it on their crops, with this amount being needed per acre per spray.
- **Reduction of Import Burden:**
 - India currently imports significant quantities of fertiliser to meet domestic demand.
 - The adoption of domestically-produced **Nano DAP (produced in Kalol, Gujarat)** is set to significantly reduce this import burden.
 - It will not only take Indian agriculture forward in foodgrain production but it will also make **India self-reliant in fertiliser production**.
- **Lesser Impact on Environment:**
 - Because of its liquid nature, nano DAP will have less impact on the environment, which leads to lower land contamination than other fertilisers.
 - By utilising liquid DAP and liquid urea, farmers may increase the number of earthworms in their fields and transition to natural farming without sacrificing productivity or profitability.

What is Nano Urea?

- **About:**
 - **Nano Urea is urea in the form of a nanoparticle.** It is a [nutrient \(liquid\)](#) to provides **nitrogen to plants as an alternative** to the conventional urea.
 - Urea is a chemical nitrogen fertiliser, white in colour, which artificially provides nitrogen, a major nutrient required by plants.
 - It is **developed to replace conventional urea** and it can curtail the requirement of the same by at least 50%.
 - It **contains 40,000 mg/L of nitrogen in a 500 ml bottle** which is **equivalent to the impact of nitrogen nutrient provided by one bag of conventional urea**.
- **Developed at:**
 - It has been indigenously developed at **Nano [Biotechnology](#) Research Centre, Kalol, Gujarat in line with [Atmanirbhar Bharat](#)** and Atmanirbhar Krishi.
 - India is dependent on imports to meet its [urea requirements](#).
- **Objective:**
 - It is aimed at **reducing the unbalanced and indiscriminate use of conventional urea**, increasing crop productivity, and reducing soil, water, and air pollution.

What are the Concerns About Using Nano DAP?

- **Reduced Fertiliser Input:**
 - While **nano urea and nano DAP offer convenience** in handling and application, their **use may lead to a reduction in the total volume of fertilizer applied** compared to conventional fertilizers.
 - This reduction can result in lower nutrient availability to crops, **leading to decreased productivity**.
- **Nutrient Imbalance:**
 - Nano formulations may **alter the nutrient balance in soil and plants**, potentially affecting crop growth and development. This imbalance could result in **deficiencies or toxicities of certain nutrients**, impacting overall yield and quality.
- **Environmental Impact:**
 - The long-term environmental impact of nano-fertilisers is not yet fully understood. There are **concerns about the potential accumulation of nanoparticles in soil** and water, which could **affect ecosystems and biodiversity**.
- **Health and Safety:**
 - Concerns include the **potential for these particles to enter the food chain** and impact human health. It's **crucial to assess the potential risks associated with exposure to nanoparticles during production**, application, and consumption.
 - Excessive **concentrations of nano-sized particles pose health risks** due to their

ability to deeply penetrate the body's tissues and cells.

Note

IFFCO is one of India's biggest cooperative societies which is wholly owned by Indian Cooperatives.

- Founded in **1967 with just 57 cooperatives**, today it is an amalgamation of over 36,000 Indian Cooperatives with diversified business interests ranging from General Insurance to Rural Telecom apart from its core business of manufacturing and selling fertilisers.

Conclusion

It's important to note that ongoing research is being conducted to address these concerns and to better understand the benefits and risks associated with nano-fertilizers. As with any new technology, a cautious and well-informed approach is crucial to ensure sustainable and responsible use in agriculture.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims:

Q. With reference to chemical fertilizers in India, consider the following statements: (2020)

1. At present, the retail price of chemical fertilizers is market-driven and not administered by the Government.
2. Ammonia, which is an input of urea, is produced from natural gas.
3. Sulphur, which is a raw material for phosphoric acid fertilizer, is a by-product of oil refineries.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 and 3 only
- (c) 2 only
- (d) 1, 2 and 3

Ans: (b)

Exp:

- The Government of India subsidizes fertilizers to ensure that fertilizers are easily available to farmers and the country remains self-sufficient in agriculture production. The same has been achieved largely by controlling the price of fertilizer and the amount of production. Hence, statement 1 is not correct.
- Ammonia (NH₃) has been synthesized from natural gas. In this process, natural gas molecules are reduced to carbon and hydrogen. The hydrogen is then purified and reacted with nitrogen to produce ammonia. This synthetic ammonia is used as fertilizer, either directly as ammonia or indirectly after synthesis as urea, ammonium nitrate, and monoammonium or diammonium phosphates. Hence, statement 2 is correct.
- Sulfur is a major by-product of oil refining and gas processing. Most crude oil grades contain some sulfur, most of which must be removed during the refining process to meet strict sulfur content limits in refined products. This is done through hydrotreating and results in production of H₂S gas, which is converted into elemental sulfur. Sulfur can also be mined from underground, naturally-occurring deposits, but this is more costly than sourcing from oil and gas and has largely been discontinued. Sulfuric acid is used in the production of both Monoammonium Phosphate (MAP) and Diammonium Phosphate (DAP). Hence, statement 3 is correct.
- Therefore, option B is the correct answer.

Mains:

Q. What are the different types of agriculture subsidies given to farmers at the national and at state levels? Critically, analyse the agricultural subsidy regime with reference to the distortions created by it. **(2013)**

Renewables 2023 Report of IEA

For Prelims: [International Energy Agency](#), [Renewable energy](#), [Solar Energy](#), [Net Zero Emissions by 2050](#), [Panchamrit Goals](#), [Nationally Determined Contribution](#), [Pradhan Mantri- Kisan Urja Suraksha evam Utthaan Mahabhiyan](#), [Production Linked Incentive \(PLI\) Scheme for High-Efficiency Solar PV Modules](#), [Offshore Wind Energy Policy](#), [Global Biofuel Alliance](#), [International Solar Alliance](#)

For Mains: Major Takeaways of Renewables 2023 Report, India's Renewable Energy Targets and Related Government Interventions.

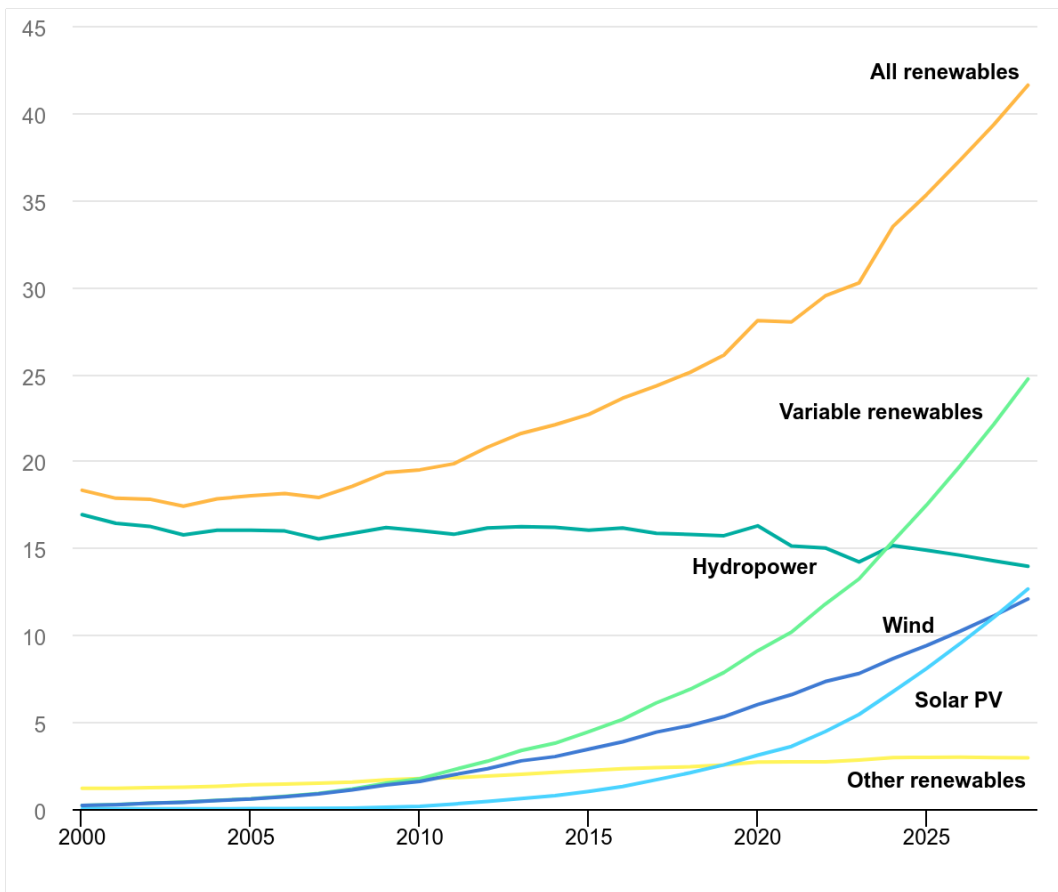
Source: [IEA](#)

Why in News?

The [International Energy Agency \(IEA\)](#)'s recent **Renewables 2023 report** paints a complex picture of the renewable energy sector, highlighting both progress and challenges.

What are the Major Highlights of the Renewables 2023 Report?

- **Record Growth and China's Dominance:** Global annual [renewable capacity](#) additions surged by nearly **50% to almost 510 gigawatts (GW) in 2023**, marking the fastest growth rate in two decades.
 - **China played a pivotal role**, commissioning as much [solar photovoltaics \(PV\)](#) in 2023 as the entire world did in 2022, while **wind additions grew by 66%** year-on-year.
- **Global Power Mix Transformation:** Renewables are projected to **surpass coal as the largest source of electricity generation by 2025**, with **wind and solar PV becoming dominant sources by 2028**.



▪ Accelerated Growth in Key Regions:

- **US, EU, India, Brazil:** Supportive policies and improving economic attractiveness are driving accelerated growth in **solar PV** and [onshore wind installations](#) in these regions.
- **Middle East and North Africa:** Policy incentives are spurring renewable capacity growth.
 - While **sub-Saharan Africa** is lagging despite its resource potential.

▪ Growth Forecast for India: India is forecast to add **205 GW over 2023-2028**, doubling 2022's cumulative installed capacity, making it the **world's third-largest market for renewables**.

▪ Solar PV Market Dynamics: Solar PV module prices dropped by **nearly 50% in 2023** due to increased manufacturing capacity.

- Solar PV and onshore wind are cheaper than both new and existing fossil fuel plants, driving their rapid adoption globally.

▪ Biofuel Expansion and EV Adoption: Emerging economies, led by **Brazil**, are driving biofuel expansion.

- Biofuels and renewable electricity in EVs are forecasted to offset significant oil demand by **2028**, emphasizing their complementary role.

▪ Major Challenges Highlighted in the Report:

- **Financial Constraints:** Emerging and developing economies face inadequate financing for renewable projects.
 - Rising interest rates are increasing financing costs, posing challenges to renewable energy developers.
- **Grid Bottlenecks:** Rapid deployment of variable renewables poses **integration challenges**, leading to increased curtailment in many countries due to inadequate grid expansion.
- **Wind Industry Challenge:** The wind industry faces challenges from **supply chain disruptions**, especially in offshore wind.

▪ Major Recommendations: IEA urged governments to **triple global renewable power capacity by 2030**, aligning with the [Net Zero Emissions by 2050 \(NZE\)](#) Scenario.

- To meet the 2030 targets, addressing policy uncertainties, investing in grid infrastructure, easing administrative barriers, and enhancing financing in emerging economies is crucial.

What are India's Renewable Energy Targets and Related Government

Interventions?

- **India's Renewable Energy Targets:**
 - **Panchamrit Goals:**
 - Reaching a **non-fossil fuel energy capacity of 500 GW** by 2030.
 - Fulfilling at least **half of its energy requirements via renewable energy** by 2030
 - **Reducing CO₂ emissions by 1 billion tons by 2030**; reducing carbon intensity below 45 percent by 2030.
 - **Net-Zero emission target by 2070.**
 - In August 2022, India updated its **Nationally Determined Contribution (NDC)** according to which the target to reduce emissions intensity of its GDP has been enhanced to **45% by 2030 from 2005 level.**
- **Related Government Initiatives:**
 - **Pradhan Mantri- Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM- KUSUM)**
 - **National Solar Mission**
 - **Production Linked Incentive (PLI) Scheme for High-Efficiency Solar PV Modules**
 - **Offshore Wind Energy Policy**
 - **Global Biofuel Alliance**
 - **International Solar Alliance**
 - **Suryamitra Skill Development Programme:** It aims for skill development among the youth, considering the opportunities for employment in the growing **Solar Energy Power Project's installations.**

What is IEA?

- **Establishment and Evolution:** IEA was established in 1974 to ensure oil supply security in response to the **1973-1974 oil crisis.**
 - Initially focusing on oil supply security and policy cooperation, its mandate expanded over time to encompass a broader range of energy issues.
 - Currently, the **IEA has four main areas of focus: energy security, economic development, environmental awareness and engagement worldwide.**
 - In 2022, IEA member governments agreed to expand the Agency's mandate to guide countries towards building net-zero emission energy systems and **include critical minerals and metals** for clean energy technologies.
- **Membership:** IEA is made up of 31 member countries.
 - In addition, the IEA also includes **thirteen association countries (including India).**
 - Five countries are seeking accession to full membership, **Chile, Colombia, Israel, Latvia and Costa Rica.**
 - A candidate **country for the IEA must be a member country of the OECD.**
- **Major Reports:**
 - **World Energy Outlook Report**
 - **India Energy Outlook Report**
 - **World Energy Investment Report**
 - The Annual Energy Efficiency Market Report

Read More: [IEA Report Electricity 2024](#)

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims:

Q1. Consider the following statements:

1. "The Climate Group" is an international non-profit organization that drives climate action by

building large networks and runs them.

2. The International Energy Agency in partnership with the Climate Group launched a global initiative “EP100”.
3. EP100 brings together leading companies committed to driving innovation in energy efficiency and increasing competitiveness while delivering on emission reduction goals.
4. Some Indian companies are members of EP100.
5. The International Energy Agency is the Secretariat to the ‘Under2 Coalition’.

Which of the statements given above are correct?

- (a) 1, 2, 4 and 5
(b) 1, 3 and 4 only
(c) 2, 3 and 5 only
(d) 1, 2, 3, 4 and 5

Ans: (b)

Q.2 The term ‘Intended Nationally Determined Contributions’ is sometimes seen in the news in the context of (2016)

- (a) pledges made by the European countries to rehabilitate refugees from the war-affected Middle East
(b) plan of action outlined by the countries of the world to combat climate change
(c) capital contributed by the member countries in the establishment of the Asian Infrastructure Investment Bank
(d) plan of action outlined by the countries of the world regarding Sustainable Development Goals

Ans: (b)

Mains:

Q. Describe the benefits of deriving electric energy from sunlight in contrast to conventional energy generation. What are the initiatives offered by our government for this purpose? **(2020)**

Q. “Access to affordable, reliable, sustainable and modern energy is the sine qua non to achieve Sustainable Development Goals (SDGs)”. Comment on the progress made in India in this regard. **(2018)**

First Human Neuralink Implant

For Prelims: Brain-Computer Interface, Neuralink, [Epilepsy](#), [Parkinson's disease](#), [Virtual and Augmented Reality](#), Locked-in syndrome, Potential Applications of Brain-Computer Interface.

For Mains: Ethical Considerations Related to Brain-Computer Interface

[Source: TH](#)

Why in News?

Recently, **Elon Musk** made a recent announcement concerning the **successful implantation of a Neuralink device** in a human subject.

- The device is roughly the size of a large coin, specifically designed for implantation in the **skull for brain-computer interface**.
- Neuralink has obtained approval from the [US Food and Drug Administration \(FDA\)](#) under the "**investigational device exemption**."

What is the Brain-Computer Interface?

- A Brain-Computer Interface (BCI) is a technology that **enables direct communication between the brain and external devices, such as computers or prosthetics**, without using traditional neuromuscular pathways like nerves and muscles.
- BCIs typically involve the use of sensors to detect brain activity, which is then translated into **commands or actions**, allowing individuals to control devices or interact with the external world **using their thoughts**.

What are the Potential Applications of Brain-Computer Interface?

- **Medical Treatments:**
 - **Neurological Disorders:** Monitoring and treating conditions like [epilepsy](#), [Parkinson's disease](#), and **neurodegenerative disorders** by directly interfacing with the brain.
 - **Stroke Rehabilitation:** Assisting in **motor function recovery** and rehabilitation after a stroke.
- **Assistive Technology:** Enabling individuals with paralysis or motor impairments to control devices, such as **prosthetics, wheelchairs, or robotic limbs**, using their thoughts.
 - Restoring communication for individuals with conditions like **locked-in syndrome** (paralyzed except for the muscles that control eye movement).
- **Mental Health Monitoring:** Providing real-time data for monitoring and managing mental health conditions, such as [depression](#) or [anxiety](#).
- **Virtual and Augmented Reality Interaction:** Enhancing virtual and augmented reality experiences by allowing users to interact with digital environments using their thoughts.

What are the Ethical Considerations Related to Brain-Computer Interface (BCI)?

- **Privacy Concerns:** BCIs can potentially decode thoughts and emotions. Unauthorized access to this information raises **concerns about [cognitive privacy](#)**.
 - As with any technology that involves the collection and storage of sensitive data, there are **risks of hacking and unauthorised access to the brain data**, which could lead to identity theft or other malicious uses.
- **Neurosecurity:** There is a risk that BCIs could be manipulated to unauthorized control or manipulation of a person's thoughts or actions.
- **Equity and Accessibility:** Critics argue that BCIs could exacerbate existing social inequalities if only specific socioeconomic groups can afford the technology due to its high cost and may lead to a situation of "**cognitive divide**."
- **Medical and Therapeutic Applications:** Distinguishing between **therapeutic uses of BCIs and threats** to normal cognitive function is subjective.

Way Forward

- **Towards Neuroethics and Neuroprivacy:** Establishing ethical frameworks that define therapeutic and assistive applications of BCI and addressing **privacy, security, and consent issues associated with it**.
- **Transparency and Informed Consent:** Foster transparent communication about the

capabilities, limitations, and potential risks of BCIs to ensure users are well-informed.

- **Equitable Access:** Implement initiatives to bridge the digital and cognitive divides, ensuring that BCIs are accessible to individuals from diverse backgrounds, especially those facing **physical and mental disabilities**.
 - **Education and Awareness:** Provide education and training for researchers, healthcare professionals and the general public to ensure ethical practices.
-

Humboldt's Enigma

[Source: TH](#)

Why in News?

In recent years, **Humboldt's enigma** has garnered increased attention in the field of ecology as researchers seek to understand the **unexpected biodiversity found in mountain ecosystems**, challenging traditional beliefs.

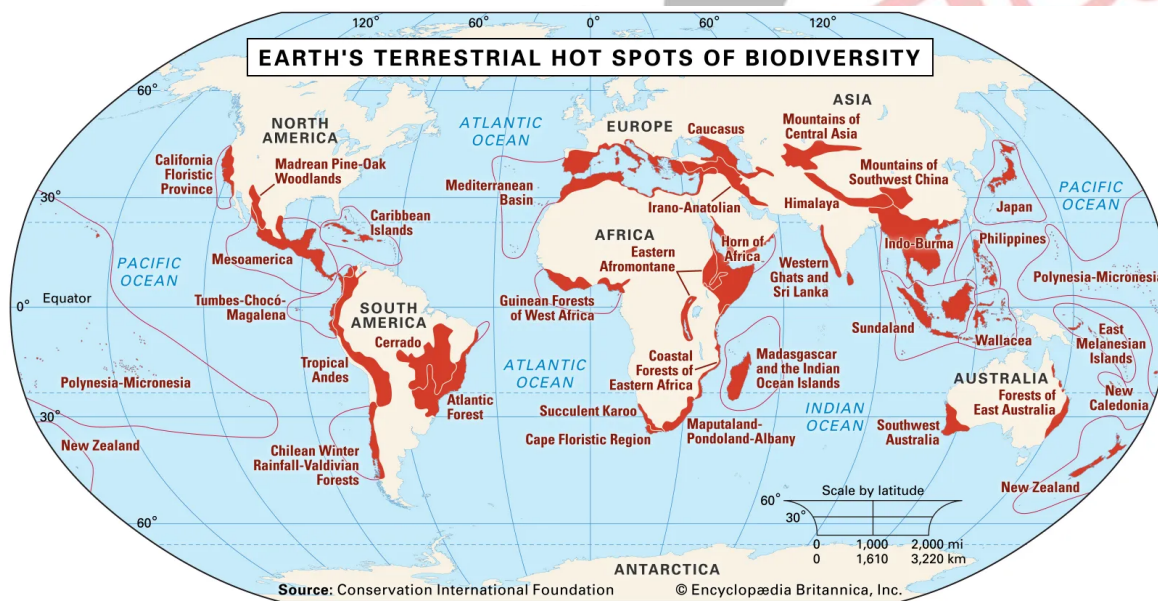
What is Biodiversity?

- **About:** Biodiversity underpins **all life on earth** and refers to the variety of **plant, animal, and microbial species** plus all the related genetic variations in the world.
- **Measurement of Biodiversity:** It is measured by two major components: **species richness and species evenness**.
 - **Species Richness measures the number of species** found in a community.
 - Tropical rainforests in the terrestrial ecosystem and coral reefs in the marine ecosystem have the highest degree of species richness.
 - **Species evenness** is a measure of the **relative abundance of the different species** making up the richness of an area.
 - **Low evenness means a few species dominate** the site.
- **Biodiversity in India:** India is one of the recognized mega-diverse countries of the world, harbouring nearly **7-8% of the recorded species of the world**.
 - India represents 4 **out of 36 globally recognised biodiversity hotspots** (Himalaya, Indo-Burma, Western Ghats and Sri Lanka, Sundaland).
 - So far, **over 91,200 species of animals and 45,500 species** of plants have been documented in the 10 **biogeographic regions** of the country.

What is Humboldt's enigma?

- **Humboldt's enigma:** Sparked by **Alexander von Humboldt's observations**, it questions the conventional notion that tropical regions, **fueled by ample sunlight**, are the primary centres of biodiversity on Earth.
 - It contends that **despite receiving less sunlight and enduring colder temperatures, mountain ecosystems defy this notion by showcasing exceptional biodiversity**, thereby challenging traditional ecological theories and prompting investigation into this anomaly.
- **Humboldt's Observations:** Humboldt suggested there was a relationship between **temperature, altitude, and humidity** on one hand and the **occurrence patterns of species or their biodiversity** on the other.
 - His example of choice was the **Chimborazo mountain in Ecuador**, which has today become an important illustration of mountain diversity.

- **Factors Contributing to Mountain Biodiversity:**
 - **Varied Topography:** Mountains offer a mosaic of **microclimates**, ranging from snow-capped peaks to sheltered valleys.
 - This diversity creates distinct ecological niches, suitable for a wider range of species.
 - **Isolation:** Mountains act as **isolated "islands" in the sky**, promoting unique evolutionary pathways and endemic species, found nowhere else.
 - For example, the **Hawaiian Islands are home to many endemic species of plants and animals**, which evolved in isolation from the mainland.
 - **Dynamic landscapes:** Geological processes like **landslides and glacial retreats** constantly reshape mountain landscapes, creating opportunities for new species to colonize and evolve.
- **India's Enigmatic Mountains:** India's diverse mountain ranges, including the **Himalayas especially Eastern Himalayas**, serve as ideal settings to probe Humboldt's enigma.
 - According to the World Wildlife Fund, the Eastern Himalayas harbours thousands of different species, including over **10,000 plants, 900 species of bird, and 300 species of mammal**. Many of which are endangered or critically endangered.
 - Its grasslands are home to the densest populations of **Bengal tigers, Asian elephants, and one-horned rhino**.
 - Its mountains offer refuge to **snow leopards, red pandas, takins, Himalayan black bears, and golden langurs**, and its rivers contain the world's rarest **dolphins (Gangetic)**.
- **Related Indian Government Initiatives:**
 - [National Mission on Sustaining Himalayan Ecosystem](#)
 - [National Mission on Biodiversity and Human Wellbeing](#)



Note

The world's tropical areas receive more energy from the Sun because of the **earth's angle of inclination**. Therefore, the tropics have greater primary productivity, which then facilitates greater diversity: **more ecological niches become available**, creating more complex ecosystems and greater biological diversity.

Prelims:

Q. If you travel through the Himalayas, you are likely to see which of the following plants are naturally growing there? (2014)

1. Oak
2. Rhododendron
3. Sandalwood

Select the correct answer using the code given below:

- (a) 1 and 2 only
(b) 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Ans: (a)

Q. When you travel in Himalayas, you will see the following: (2012)

1. Deep gorges
2. U-turn river courses
3. Parallel mountain ranges
4. Steep gradients causing landsliding

Which of the above can be said to be the evidence for Himalayas being young fold mountains?

- (a) 1 and 2 only
(b) 1, 2 and 4 only
(c) 3 and 4 only
(d) 1, 2, 3 and 4

Ans: (d)

Mains:

Q. Differentiate the causes of landslides in the Himalayan region and Western Ghats. (2021)

Q. How will the melting of Himalayan glaciers have a far-reaching impact on the water resources of India? (2020)

Q. "The Himalayas are highly prone to landslides." Discuss the causes and suggest suitable measures of mitigation. (2016)

NCGG Empowers African Civil Servants

The **National Centre for Good Governance (NCGG)**, recently concluded its Advanced Leadership Development Programme on Public Policy and Governance for **Civil Servants** of the **African Region**.

- It focused on **Land Administration, Sustainable Development, and Public Policy Practices** and was attended by officers from **Eritrea, Kenya, Ethiopia, Tanzania, and Gambia**, the program aimed to foster collaboration and knowledge exchange.

- Also, a MyGov portal has been established in Gambia.
- It marks a significant achievement for NCGG in its role as a capacity-building institution under the [Indian Technical and Economic Cooperation Programme \(ITEC\) program](#).
- Instituted in 1964, ITEC is the leading capacity-building platform of the **Ministry Of External Affairs, Government of India**.
- NCGG was set up in 2014 by the Government as an apex-level autonomous institution under the **Ministry of Personnel, Public Grievances and Pensions**.

Read more: [Good Governance](#), [India-Africa Partnership](#)

Bharat Ratna to LK Advani

Recently, the government has announced that Veteran leader, **Shri Lal Krishna Advani** will be conferred with [Bharat Ratna](#), the highest civilian award of the nation.

- He served as the **7th Deputy Prime Minister of India** from 2002 to 2004. He also served as a Home Minister and Information and Broadcasting Minister as well.
- Born in **Karachi (present-day Pakistan)** on 8th November 1927, he joined the Rashtriya Swayamsevak Sangh in 1942 and relocated to Delhi from Sindh in **1947 during Partition**.
- Instituted in **1954**, the [Bharat Ratna](#) is conferred in recognition of exceptional service/performance of the highest order, without distinction of race, occupation, position, or sex.

Read more: [Bharat Ratna to Karpoori Thakur](#)

Vyommitra

Source: [PIB](#)

Recently, the Ministry of Science & Technology announced that **woman robot astronaut "Vyommitra"** will fly into Space ahead of [Indian Space Research Organisation's \(ISRO\)](#) ambitious "[Gaganyaan mission](#)", which will be **India's first human manned Space Flight** carrying Indian Astronauts into Space.

- The "Vyommitra" Mission is scheduled for the third quarter of 2024 while a **manned mission "Gaganyaan"** is scheduled to be launched in 2025.
- "Vyommitra" is a name derived from two Sanskrit words namely, "**Vyoma**" (meaning Space) and "**Mitra**" (meaning Friend). This Female Robot Astronaut is equipped with the capability to **monitor Module Parameters, issue Alerts and execute Life Support operations**.
 - It can perform tasks such as operating six panels and responding to queries.
 - Vyommitra Astronaut is designed in such a manner to **simulate human functions in the Space environment** and interact with the Life Support System.
- The Gaganyaan project aims to **demonstrate human space capabilities**, launching astronauts into a 400-kilometer orbit and safely bringing them back to Earth, landing in India's sea waters.



Vyommित्रा: India's First Spacefaring Robot

Read more: [Space Missions in 2024, India's Space Endeavors](#)

India Energy Week 2024

Source: [PIB](#)

The **Prime Minister of India** inaugurated the [India Energy Week \(IEW\) 2024](#) in Goa and the [Oil and Natural Gas Corporation Limited \(ONGC\) Sea Survival Centre](#), and also participated in the [Viksit Bharat](#), Viksit Goa 2047 programme.

- **India Energy Week 2024** is being held from **6th to 9th February in Goa**. It is India's **largest and only all-encompassing energy exhibition and conference**, bringing together the entire energy value chain, and will **catalyse India's energy transition goals**.
 - Encouraging, fostering and integrating startups into the energy value chain will be an important focus for IEW 2024.
 - India's position as the **world's third largest energy, oil, and Liquid petroleum gas (LPG) consumer**, as well as the **fourth largest Liquefied natural gas (LNG) importer and refiner**, was emphasised at IEW.
 - The event reflects **India's commitment to global cooperation in the energy sector**, with a focus on collaboration and knowledge sharing in sustainable energy development.
- **ONGC Sea Survival Centre** is an **Integrated Sea Survival Training Centre** to advance the **Indian sea survival training ecosystem** to global standards.
 - It is anticipated to train 10,000-15,000 personnel annually, emphasising simulated exercises in harsh conditions.

Read more: [India Energy Week](#)
