

## The Hindu Important News Articles For UPSC CSE

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### Edition : International Table of Contents

|                                                                                                                               |                                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>Page01 &amp; 12</b><br><b>Syllabus: GS III : Indian Economy / Preliminary Examination</b>                                  | <b>Retail inflation climbs past RBI target to 4.4% &amp; Trade deficit jumps fourfold in June on surging imports</b> |
| <b>Page 04</b><br><b>Syllabus : GS II : Indian Polity / Preliminary Examination</b>                                           | <b>All Ladakh districts to get autonomous hill councils</b>                                                          |
| <b>Page07</b><br><b>Syllabus: GS III : Science and Technology / Preliminary Examination</b>                                   | <b>Study finds efficient way to filter nuclear wastewater</b>                                                        |
| <b>Page 10</b><br><b>Syllabus: GS III : Indian Economy &amp; Environment</b>                                                  | <b>Can biogas aid India's energy security?</b>                                                                       |
| <b>Page 10</b><br><b>Syllabus: GS II &amp; III: International Relations and Science &amp; Technology</b>                      | <b>What is the India-Australia uranium supplies agreement?</b>                                                       |
| <b>Page 08: Editorial Analysis</b><br><b>Syllabus : GS II &amp; III: International Relations and Science &amp; Technology</b> | <b>The right path for India's nuclear power development</b>                                                          |

**Page01 & 12: GS III : Indian Economy/ Preliminary Examination**

According to recently released official data, in June 2026, India's economy faced pressure on a twin front. First, the country's retail inflation reached an 18-month high of 4.4%, crossing the Reserve Bank of India's (RBI) medium-term target of 4%. Second, the country's overall trade deficit multiplied by nearly four times to reach \$15.3 billion in June 2026, primarily due to a sharp surge in the import of crude oil, electronics, and gold. Both these developments reflect the combined impact of domestic supply chain disruptions and ongoing geopolitical tensions in West Asia.

## Trade deficit jumps fourfold in June on surging imports

Commerce Ministry data showed India's overall exports, including goods and services, grew 9.5% to \$73.4 billion in June 2026; total imports, on the other hand, grew nearly 27% to \$88.8 billion

**T.C.A. Sharad Raghavan**  
NEW DELHI

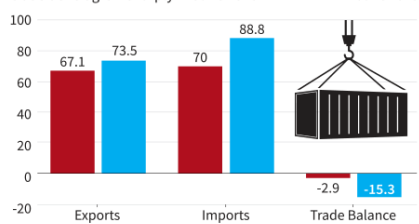
India's trade deficit grew over fourfold to \$15.3 billion in June 2026 primarily due to high growth in merchandise imports, which were skewed by a spurt in the value of imports of crude oil, electronic and electrical goods, and gold, according to official data.

Data released by the Ministry of Commerce and Industry on Monday showed India's overall exports, including both goods and services, grew 9.5% to \$73.4 billion in June 2026. Total imports, on the other hand, grew nearly 27% to \$88.8 billion.

"Looking at the data, you would see that merchandise imports in particular have grown by a significant amount and think that this is a matter of concern, but the fact is that these imports are being driven by just a few commodities such as petroleum products and crude oil, gold, and electronics," Commerce Secretary Rakesh Agrawal said during a

### Unbalanced trade

A surge in imports meant that the overall trade deficit grew sharply in June 2026



Source: Ministry of Commerce and Industry • Note: Negative numbers denote a deficit.

press briefing. "Gold and oil have increased in value because of higher prices due to the prevailing geopolitical situation, and electronics imports are rising because of higher consumption within the economy and also inputs being used for manufacturing," he added.

Merchandise imports

grew 31% to \$70.8 billion as opposed to exports, which grew at a relatively slower 15.5% to \$40.4 billion in June 2026. As a result, the merchandise trade deficit stood at \$30.4 billion, about 59% higher than in June 2025. On the services front, India's trade surplus shrank in June 2026 as imports outpaced exports. Services exports grew 2.9% in June 2026 to \$33 billion, while imports grew 12.7% to \$17.9 billion. As a result, the services trade surplus fell 6.8% in June 2026 to \$15.1 billion.

"The widening of the June trade deficit is largely led by higher net imports of oil and electronics," said Upasna Bhardwaj, Chief Economist, Kotak Mahindra Bank.

## Retail inflation climbs past RBI target to 4.4%



Food inflation touched 5.05% in June, the highest in the new series of the CPI. REUTERS

**T.C.A. Sharad Raghavan**  
NEW DELHI

India's retail inflation has crossed the Reserve Bank of India's 4% target for the first time since January 2025, touching 4.4% in June, an 18-month high. It stood at 3.93% in May.

Inflation, as measured by the new series of the Consumer Price Index (CPI), was driven by rising food and fuel prices amid the crisis in West Asia as well as a weaker-than-normal monsoon.

Food inflation touched 5.05% in June, the highest in the new series of the CPI.

The transport segment saw inflation rising to 4.3% in June, compared with 1.7% in May, following rise in fuel prices.

"The June CPI inflation of 4.4%, exceeding the RBI's medium-term target of 4%, reflects persistent pressures from global geopolitical uncertainties and supply chain disruptions," said Vivek Rathi, national director of research at Knight Frank India.

"On the domestic front, food inflation has remained a key driver, due to weather-related disruptions to agricultural output, and uneven monsoon distribution across certain regions," Vivek Rathi, national director of research

Inflation was driven by rising food and fuel prices amid the West Asia war and a weak monsoon

at Knight Frank India said. Looking ahead, Aditi Nayar, chief economist at ICRA, said retail food prices have continued to harden in July too when compared to June as well as July 2025, suggesting that the inflation in this segment is likely to be even higher in July 2026.

"In addition to food items, the non-food component may also exert pressure on the headline CPI print in the month, partly owing to the pass-through of higher fuel prices into prices of other items," she added.

The other area that witnessed high inflation was the "personal care, social protection and miscellaneous goods & services" category, which saw inflation of 16.7% in June 2026, although this was the lowest since January 2026, the earliest period for which the new series has data.

Inflation in this segment was propelled by the rising prices of gold and silver in June, which was exacerbated by the higher import duties imposed on the two metals.

### Surge in Retail Inflation: Key Points

- **Above RBI's Target:** In June 2026, Consumer Price Index (CPI) based retail inflation stood at 4.4% (which was 3.93% in May). This is the first time since January 2025 that it has crossed the RBI's ideal target of 4%.
- **Food Inflation the Main Factor:** Food inflation reached 5.05% in June, which is the highest level ever recorded in the new series of CPI.
- **Impact of Weak Monsoon and Weather:** Agricultural production has been affected due to uneven monsoon distribution and weather-related disruptions in some parts of the country, which has driven up food prices. This is likely to accelerate further in July 2026.

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## Daily News Analysis

- **Rise in Fuel and Transport Costs:** Due to the West Asia crisis, global crude oil prices have risen. As a result, inflation in India's transport sector increased from 1.7% in May to 4.3% in June.
- **Pressure on Non-Food Components:** The increased fuel prices are also impacting the cost of other goods and services (Pass-through effect).
- **Impact of Precious Metals:** High inflation of 16.7% was observed in the 'personal care and miscellaneous services' sector, mainly due to the rise in global prices of gold and silver and the high import duties imposed on them.

### Widening Trade Deficit: Key Points

- **Imbalance in Imports and Exports:** In June 2026, India's total exports grew by 9.5% to \$73.4 billion, while total imports increased at a massive rate of 27% to \$88.8 billion. Due to this, the overall trade deficit reached \$15.3 billion.
- **Merchandise Trade Deficit:** On the merchandise front alone, imports rose by 31% (\$70.8 billion), while exports grew by only 15.5% (\$40.4 billion). Consequently, the merchandise trade deficit increased by 59% compared to June 2025, reaching \$30.4 billion.
- **Major Products Driving Imports:** According to the Ministry of Commerce, this deficit widened primarily due to three factors:
  - **Crude Oil and Petroleum Products:** Prices remain high due to geopolitical tensions.
  - **Gold:** Price appreciation in the international market and domestic demand.
  - **Electronics and Electrical Goods:** Increasing domestic consumption and rising imports as inputs/raw materials for manufacturing.
- **Shrinking Services Surplus:** India's service sector trade surplus declined by 6.8% to \$15.1 billion in June 2026, as services imports (12.7%) grew at a faster pace compared to services exports (2.9%).

### Impact and Concerns for Indian Economy

- **Pressure on Monetary Policy:** With inflation moving above 4%, it will be difficult for the RBI to reduce interest rates (Repo Rate) in upcoming monetary policy reviews. Expectations of rate cuts to boost economic growth may face a setback.
- **Impact on Current Account Deficit (CAD):** The four-fold widening of the trade deficit and the shrinking services surplus will put pressure on India's Current Account Deficit, which could pose a risk to macroeconomic stability.
- **Exchange Rate of the Rupee:** High import bills and a widening trade deficit will increase the demand for dollars, which may exert depreciation pressure on the Indian Rupee against the US Dollar.
- **Impact on Domestic Consumption:** Dearer essential items like food and fuel will affect the purchasing power of the general public, which could lead to a decline in rural and urban consumption.

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## Conclusion

The economic data for June 2026 clarifies that the Indian economy currently remains vulnerable to external shocks (such as the West Asia crisis and global commodity price volatility) and internal factors (such as an uneven monsoon). Although the Commerce Ministry's argument is correct that electronics imports are boosting domestic manufacturing, excessive dependence on oil and gold remains a matter of concern.

As a way forward, the government will have to take proactive steps to strengthen the agricultural supply chain and control food prices. At the same time, for long-term stability, efforts must be accelerated to reduce dependence on crude oil imports (through renewable energy and ethanol blending) and to make non-services exports competitive, so that the trade deficit can be kept within a safe limit.



## UPSC Prelims Exam Study Questions

**Question:** Consider the following statements:

1. The Reserve Bank of India's (RBI) medium-term inflation target is 4%.
2. The Reserve Bank of India calculates Consumer Price Index (CPI)-based inflation.
3. Food inflation is a major component of the CPI.

**Which of the above statements is/are correct?**

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

**Ans:** b)

## UPSC Mains Practice Questions

**Question:** "High inflation and a widening trade deficit are considered indicators of a 'twin macroeconomic crisis' for a developing economy." Discuss this statement in the context of India. (10Marks, 150Words)

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**Page 04:GS II : Indian Polity / Preliminary Examination**

Recently, the Ladakh administration has announced the creation of 17 new tehsils to strengthen governance at the grass-roots level, bringing the total number of tehsils in the Union Territory (UT) to 32. Along with this, it has been decided to extend the Ladakh Autonomous Hill Development Council (LAHDC) Act to all 7 districts of Ladakh (Leh, Kargil, Sham, Nubra, Changthang, Zaskar, and Drass). The Central Government is also considering granting a special 'sui generis' (unique/distinct) model under Article 371 to protect the unique cultural and geographical identity of Ladakh.

**Key Administrative Reforms and Their Objectives**

- **Administrative Decentralization:** With the creation of 17 new tehsils, citizens living in remote border villages will not have to travel long distances for government services.
- **Strengthening of Infrastructure:** New divisions have been created under Public Health Engineering (PHE), Flood Control, Public Works Department (PWD), and PMGSY to improve service delivery.
- **Extension of Autonomous Hill Councils:** The 5 new districts announced in April 2026 (Sham, Nubra, Changthang, Zaskar, and Drass) will now also get their independent hill councils like Leh and Kargil.
- **Three-Tier Governance:** In Ladakh, Panchayati Raj at the village level, Autonomous Hill Council (LAHDC) at the district level, and a proposed apex body at the UT level will now function.

**Powers of the Ladakh Autonomous Hill Development Council (LAHDC)**

These councils, to be constituted in all 7 districts, will have the following important powers:

- **Control over Land:** Full authority over the ownership and allotment of land within district boundaries.
- **Local Employment:** Power to regulate recruitment and promotion for district cadre posts.
- **Financial Autonomy:** Having their own dedicated Council Fund and permission to levy taxes and fees at the local level.
- **Developmental Plans:** Formulating policies according to their priorities for health, education, tourism, and social welfare.

**Proposed 'Sui Generis' Model of Article 371**

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**All Ladakh districts to get autonomous hill councils**

Ladakh administration announces creation of 17 new tehsils; Chief Secretary Ashish Kundra says several rounds of talks were held with regional representatives over constitutional safeguards

Peerzada Ashiq  
SRINAGAR

The Ladakh administration on Monday announced 17 new tehsils "to strengthen grassroots governance" in the Union Territory and said the Ladakh Autonomous Hill Development Council (LAHDC) Act will be extended to all seven districts of the region.

"The administration is working on an institutional framework suited to Ladakh's unique requirements and is also taking steps to extend the benefits of the Ladakh Autonomous Hill Development Council (LAHDC) Act to all seven newly created districts through appropriate legal provisions," said Ladakh Chief Secretary Ashish Kundra.

Earlier, Ladakh had only two districts of Leh and Kargil. However, five new districts of Sham, Nubra, Changthang, Zaskar and Drass were notified in April. With 17 additional tehsils, Ladakh has a total of 32 tehsils now. "These initiatives would bring government services closer to the people, reduce travel for citizens living in remote villages and strengthen infrastructure and



**Governance boost:** With the creation of new tehsils, the Union Territory has a total of 32 tehsils now. FILE PHOTO

development across regions, including Zaskar, Drass, Nubra, Changthang and Sham," said Mr. Kundra.

He said the administration has issued posting orders for tehsildars in 17 newly created tehsils. "Four new divisions under the Public Health Engineering (PHE) and Flood Control Department, along with five new divisions under the Public Works Department (PWD) and PMGSY (Pradhan Mantri Gram Sadak Yojana), have been created to strengthen service delivery in remote areas," he added.

He said significant progress has been made in government recruitment, decentralised governance, and ongoing discussions on constitutional safeguards for Ladakh.

On the issue of constitutional safeguards, Mr. Kundra said several rounds of discussions have been held with representatives of religious organisations and civil society bodies. "The minutes of the meetings held on May 22 and July 3 have been shared in the public domain to ensure transparency. There is broad consensus on protecting Ladakh's land, culture and identity while promoting inclusive development," said Mr. Kundra.

**Glaring imbalance: KDA** In July, the draft shared by a team from the Union Home Ministry in Leh suggested that the Centre was considering a customised sui generis model, most suitable for Ladakh, under the provisions of Article 371 for the Union Territory.

The Kargil-based civil society organisation, the Kargil Democratic Alliance (KDA), said the tehsil figures "reveal a glaring imbalance". "While the erstwhile Leh district has been allotted 12 new tehsils, the erstwhile Kargil district has received only five," said KDA leader Sajjad Kargili. He said this disparity was difficult to reconcile with objective parameters. "Kargil has a larger population and a greater number of villages than the other five newly created districts combined. Yet its administrative needs appear to have been overlooked. Even more striking is the fact that Drass has not been granted a single additional tehsil, despite its substantial population, large number of villages, and genuine administrative requirements," he said.

He said there were instances where a new tehsil was created for a single village. "It has raised serious questions about the criteria adopted for this exercise. This also shows the absence of a sense of justice from the administration and also shows discriminatory approach towards the people of Kargil and Drass," he added.

## Daily News Analysis

- **UT-Level Body:** There is a proposal to create an overarching Union Territory-level body above all 7 hill councils.
- **Broad Powers:** This apex body will be entrusted with legislative, executive, financial, and administrative responsibilities.
- **Cultural and Demographic Protection:** Its primary objective is to provide constitutional protection to Ladakh's fragile ecology, unique culture, land rights, and local jobs.

### Regional Concerns and Challenges (KDA's Perspective)

While this move by the administration has been welcomed, the Kargil Democratic Alliance (KDA) has raised some serious questions:

- **Regional Disparity:** Out of the total 17 new tehsils, the Leh region alone has been given 12, while the Kargil region has received only 5, which the KDA considers unfair.
- **Population vs. Administrative Representation:** According to Kargil leaders, despite Kargil's population and number of villages being higher compared to other new districts, its administrative interests have been ignored.
- **Neglect of Drass:** Despite being declared a full district, Drass has not been given a single additional tehsil.
- **Lack of Logical Criteria:** It is alleged that in some places, a tehsil has been created for just a single village, which raises questions about the fairness of administrative criteria.

### Conclusion

Ever since Ladakh was made a Union Territory without a legislature in 2019, there has been a sense of demographic and cultural insecurity. The administration's proposal to extend autonomous councils to all 7 districts and provide protection under Article 371 is a progressive step toward fulfilling local aspirations. However, addressing the internal regional imbalance (Leh vs. Kargil) and administrative disparities within Ladakh is extremely crucial. For sustainable and inclusive development, it is necessary for the government to maintain continuous and transparent dialogue with civil societies (such as the Leh Apex Body and the Kargil Democratic Alliance) so that both peace and national security in the border region can be ensured.

### UPSC Prelims Practice Questions

**Question:** Consider the following statements regarding the Ladakh Autonomous Hill Development Council (LAHDC):

1. It is a constitutional body.
2. It possesses powers related to the allotment and use of land.
3. It plays a role in the formulation and implementation of development plans at the district level.

**Which of the above statements is/are correct?**

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

**Ans:a)**

### UPSC Mains Practice Questions

**Question:** "Administrative decentralization in border areas is not merely a means of good governance but also a crucial foundation for national security." Explain this in the context of Ladakh. **(10 Marks, 150 Words)**

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**Page 07 : GS III : Science and Technology / Preliminary Examination**

In the year 2023, Japan started a controversial process of releasing treated but still radioactive wastewater from the Fukushima nuclear power plant into the Pacific Ocean. Although most of the heavy radioactive elements were removed from this water, a dangerous contaminant named Tritium remained in it.

Recently, a new study has been published by researchers from China in the journal 'Environmental Science & Technology'. In this study, a revolutionary and highly effective method has been discovered to efficiently separate tritium from water using Metal-Organic Framework (MOF) technology, which could prove to be a major step toward nuclear waste management.

**What is Tritium and why is it dangerous?**

- **Isotope of Hydrogen:** Tritium is a radioactive isotope of hydrogen. When it binds with oxygen, it forms 'tritiated water' (HTO).
- **Difficulty in Separation:** Chemically, it is exactly identical to normal water, making it extremely difficult to separate from pure water using standard filters or chemical processes.
- **Global Practice:** Currently, instead of removing tritium in the global nuclear industry, it is diluted by mixing it with large amounts of normal water and then released into the sea.
- **Biological Impact:** According to experts, tritium is easily absorbed by the bodies of living organisms and spreads rapidly throughout the body via the blood, which can pose long-term health risks. Concerns about its impact are higher in the coastal regions of South Korea and China.

**Current Technology and its Limitations**

- **Water Distillation:** Currently, the most practical way to remove tritium is to boil the water and separate the components based on the slight difference in their boiling points.
- **High Cost and Massive Size:** Since the difference in boiling points is very small, it requires distillation towers that are hundreds of meters high.
- **Excessive Energy Consumption:** This process is very expensive and consumes a massive amount of energy, making it practically impossible to clean the millions of tons of water accumulated in Fukushima.
- **Passive Packings:** Current towers use passive packing materials, which only provide surface area and rely on gravity, resulting in extremely low efficiency.

**New MOF Technology: How does it work?**

- **Active Packing:** In the new study, researchers have turned passive packing into 'active' packing. They coated a stainless-steel mesh with a special metal-organic framework, NH<sub>2</sub>-MIL-101(Cr).
- **Microscopic Sponge:** The metal-organic framework works like a microscopic sponge. Due to this coating, the available surface area of the packing increased by 32 times.

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## Daily News Analysis

- **Atom Swapping:** The chromium-oxygen clusters and nitrogen-hydrogen attachments present inside this framework 'catch' tritium atoms from the liquid and swap them with normal hydrogen atoms.

### Significance of the Findings

- **Record-breaking Efficiency:** In laboratory tests, this modified packing achieved a separation efficiency of 42.5 theoretical plates per meter, which is a record in the world of chemical engineering.
- **Effectiveness at Industrial Scale:** At an industrial height of 10 meters, this new material would be 134 times more effective than the best-reported material to date.
- **Comparison with Commercial Standards:** It was found to be 1 million (10 Lakh) times more effective than the standard commercial packing used in the industry today.

### Conclusion

This research is a path-breaking step toward safer and more sustainable management of nuclear energy. Programmable porous materials, such as Metal-Organic Frameworks (MOF), hold immense potential for tackling complex future isotope-contaminant challenges.

If this technology is successfully scaled from the laboratory to the industrial level, it will not only provide a permanent solution to crises like Fukushima but will also prove to be a milestone in protecting marine ecosystems and human health globally by preventing the discharge of radioactive tritium into natural water bodies in the future.

### UPSC Mains Exam Study Questions

**Question:** Nuclear energy is considered a source of clean energy, yet the safe management of nuclear waste remains its greatest challenge. Critically examine this. **(10 Marks, 150 Words)**

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**Page 10 : GSIII : Indian Economy & Environment**

Due to continuously increasing geopolitical tensions in West Asia and volatility in global energy markets, India's energy security has always been sensitive. India imports about 85% of its crude oil requirements, and 90% of its LPG imports pass through the Strait of Hormuz. To reduce this heavy dependency, tackle agricultural waste (stubble burning), and strengthen the rural economy, the Government of India is promoting 'Compressed Biogas' (CBG) as a major alternative fuel.

# Can biogas aid India's energy security?

India, which imports nearly 85% of its crude oil needs, remains vulnerable to global energy shocks. Over the years, it has pushed several initiatives to promote compressed biogas. Despite these efforts, progress has been limited: government support and incentives could provide a boost to the sector

## EXPLAINER

V. Nivedita

**T**ensions in West Asia continue to keep global energy markets on edge. India imports nearly 85% of its crude oil needs, much of it from West Asia, and supplies faced disruptions due to the Israel-U.S.-Iran war. While the government has diversified its crude oil suppliers, around 90% of India's LPG imports still transit through the Strait of Hormuz, making any instability in the region a potential risk to India's energy security.

Over the years, India has pushed several initiatives to promote alternate fuels like compressed biogas to reduce dependence on imported fuel, tackle agricultural waste and support rural incomes. But despite ambitious targets and policy support, progress has remained limited.

### The search for an alternative fuel

Biogas is a mixture of methane, CO<sub>2</sub> and small quantities of other gases produced by anaerobic digestion of organic matter. It can be processed and compressed to get Compressed Biogas (CBG). It is chemically identical to CNG; renewable, carbon-neutral and can be produced from waste. It can be used directly to produce electricity, heating or as an energy source for cooking.

India has also been trying to blend biogas into its gas supply for at least a decade. The push gathered pace in 2018, when the Sustainable Alternative Towards Affordable Transportation (SATAT) initiative was launched with a target of establishing 5,000 plants by 2023. Only 132 are completed as of June 3, 2026.

The Centre launched the GOBARdhan (Galvanising Organic Bio-Agro Resources Dhan) scheme to increase CBG production. Under this 'waste to wealth' programme, the government offered grants of up to ₹50 lakh per district for



A biogas plant at the Waste-to-Energy unit in Koramangala in Bengaluru. J. ALLEN EGENUSE

community biogas plants. ₹564 crore was earmarked for the purchase of biomass collection machinery, while ₹994 crore was allocated to build pipelines connecting biogas plants directly to the gas grid.

However, progress on the ground has remained limited. The lack of infrastructure, poor private investment, difficulties in accessing formal credit and high upfront cost of technologies have stalled progress. Financial support from the government can make biogas projects economically viable. Other incentives, like accelerated depreciation and tax holidays, would also help attract private players.

### Impact on cultivation patterns

The development of biogas has been uneven across the world, with Europe, China and the United States accounting for 90% of global production.

Germany is one of the largest producers in Europe, along with France, Denmark and the U.K. The flip for the sector came in 2000, when Germany introduced the Renewable Energy Sources Act to incentivise production.

Over the years, it introduced schemes to guarantee income to producers, gave bonuses to help operators increase their income and encouraged small-scale biogas plants. However, the country's push for biogas triggered a "corn mania", with maize cultivation rising sharply because it was highly profitable for farmers. Maize slowly started to replace other food crops. Over a decade later, the government was forced to step in and control this by introducing a cap on the use of maize in biogas plants.

This danger hits close to home. The Economic Survey 2026 noted that maize cultivation in India has increased sharply, potentially affecting crop diversity and food security. It noted that while the national maize yield increased from approximately 2.56 tonnes per hectare in FY16 to roughly 3.78 tonnes per hectare by FY25, the yields for soybeans, sunflower, rapeseed, peanuts and millets, among other crops, have either stagnated or declined.

While this trend could be attributed to technological advancements, ethanol pricing can be an important factor.

The government fixes administered

per-litre ethanol prices based on the feedstock used. The price for maize-based ethanol is higher, while the price for rice-based ethanol is lower. The price for molasses-based ethanol is fixed between the two. Between FY22 and FY25, the administered price of maize-based ethanol grew at a compound annual growth rate (CAGR) of 11.7%, making maize more lucrative for farmers.

While maize's area under cultivation and production jumped between FY22 and FY25, pulses output declined, while oilseeds and other cereals registered only modest growth.

India imports large quantities of pulses and edible oils to meet demand. Yet, instead of focusing on increasing production, the government's policy might inadvertently disincentivise farmers from cultivating them. Over time, this could increase India's dependence on imports and expose domestic food prices to greater volatility during supply shocks.

Denmark, which is targeting to use only biomethane in its gas system by 2030, offers a solution. The government discouraged the use of crops as feedstock, and the primary source is livestock manure and agricultural waste.

### Government's action plan

In 2023, the National Biofuels Coordination Committee approved a mandatory blending obligation. Gas distributors have been mandated to blend CBG into their supply from FY26. It would start at 1% and rise to 5% by FY29. In her Budget speech in February 2024, Finance Minister Nirmala Sitharaman said the phased blending of CBG in CNG for transport and Piped Natural Gas for domestic purposes "will be mandated."

To meet these targets, the government is ramping up the establishment of plants.

The question is whether the government can replicate India's ethanol blending programme with CBG. In 2014, just 1.5% of petrol was blended with ethanol. By December 2025, it had hit 20%, five years ahead of the original 2030 target.

## THE GIST

Biogas is a mixture of methane, CO<sub>2</sub> and small quantities of other gases produced by anaerobic digestion of organic matter. It can be processed and compressed to get Compressed Biogas (CBG)

In 2023, the National Biofuels Coordination Committee approved a mandatory blending obligation. Gas distributors have been mandated to blend CBG into their supply from FY26. It would start at 1% and rise to 5% by FY29.

## Key Analysis Points

### 1. How can Biogas strengthen India's energy security?

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## Daily News Analysis

- **Reduction in import dependency:** India imports about 50% of its natural gas demand (in the form of LNG). According to an estimate, if India replaces 20% of its natural gas with domestic biogas by 2030, it could save the country around \$29 billion in its import bill.
- **Complete alternative to CNG:** Compressed Biogas (CBG) is chemically completely identical to CNG (containing more than 90% methane). It can be used directly in existing gas grids and vehicles without any additional infrastructure or new pipeline networks.
- **Circular Economy:** It works on the concept of 'Waste to Wealth', where stubble, dung, and municipal solid waste are converted into fuel and organic fertilizer (FOM - Fermented Organic Manure).

### 2. Key Government Efforts and Current Status

- **SATAT Initiative (SATAT - 2018):** Its target was to establish 5,000 CBG plants in the country by 2023-24. Although this program was initially quite slow, around 210 plants have been commissioned by the year 2026, and more than 320 are in various stages of construction.
- **GOBARdhan Scheme:** Under this, a grant of up to ₹50 lakh per district has been provided for community biogas plants, along with a special budgetary allocation for biomass collection and pipeline grid connectivity.
- **Mandatory Blending Obligation:** The government has made the blending of CBG in CNG and PNG mandatory for gas distributors. A blending target of 3% has been set for the financial year 2026-27 (which has currently reached ~2%) and is to be increased to 5% by FY29.
- **Recent Policy Reforms (Budget 2026):** In the Budget 2026-27, central excise duty on blended CNG has been completely exempted, ending the problem of double taxation. Along with this, the procurement price by Oil Marketing Companies (OMCs) has also been increased and made attractive.

### 3. Main Challenges of the Biogas Sector

- **Lack of Infrastructure and Investment:** The high cost of initial technology, low investment from the private sector, and the difficulty in obtaining easy loans (Formal Credit) from banks have been major obstacles in this sector.
- **Biomass Supply Chain (Feedstock Supply Chain):** Ensuring the uninterrupted availability of stubble or organic waste throughout the year and the logistics cost of transporting it to the plants is very high.
- **Slow Progress:** Compared to ethanol blending (which increased from 1.5% in 2014 to 20% by the end of 2025), the ground progress of the biogas sector is still lagging far behind.

### 4. Potential Negative Impacts on Agriculture and Food Security (Lesson from Germany vs. India)

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- **Risk of "Corn Mania":** When Germany provided heavy subsidies for biogas, farmers abandoned food crops to cultivate only highly profitable corn (maize), which began creating a food crisis situation there, eventually forcing the government to put a cap (limit) on the use of corn.
- **Signs of Imbalance in India:** According to India's 'Economic Survey 2026', due to high procurement prices of ethanol and biogas (especially maize-based), the cultivation area of corn/maize has also rapidly increased in India.
- **Threat to Food Security:** Due to the attractive prices of corn, the production of essential crops like pulses and oilseeds has either stagnated or decreased. As a result, India is having to increase its import of pulses and edible oils, making domestic food prices vulnerable to global shocks.

### Way Forward

- **Adopting the Denmark Model:** Like Denmark, India should emphasize making animal dung, agricultural residues (stubble), and urban wet waste the primary feedstock, instead of food crops (such as corn or grains).
- **Production-Linked Incentive (PLI Scheme):** The government should bring a robust PLI scheme to reduce the operation and maintenance (O&M) costs of biogas plants.
- **Robust Supply Chain Mechanism:** In collaboration with farmers and local administration, centers should be set up at the block level for 'Biomass Aggregation'.

### Conclusion

There are no two ways about the fact that Compressed Biogas (CBG) is an effective tool to make India self-reliant in energy security and to reduce carbon emissions. However, its success will depend on how the government balances environmental and energy needs. India must avoid sacrificing its 'food security' and crop diversity at the altar of its energy security. A coherent, waste-based, and balanced policy alone can make biogas the true fuel for India's sustainable development.

### UPSC Mains Exam Study Questions

**Ques:** "Striking a balance between energy security and food security is the biggest challenge for India's biofuel policy." Explain this in the context of the experiences of Germany and India. **(10 Marks, 150 Words)**

## Page 10 : GS II & III: International Relations and Science & Technology

During Prime Minister Narendra Modi's recent visit to Australia, India and Australia finalized the 'Administrative Arrangements'. This step will enable the export of uranium from Australia to India under the 2015 'India-Australia Nuclear Cooperation Agreement'. Australia holds one-fourth (more than 25%) of the global uranium reserves. This agreement underlines India's long-term energy security, the participation of private players in the nuclear energy sector, and India's strong credentials in the field of global nuclear non-proliferation.

### What is the India-Australia uranium supplies agreement?

What do the administrative arrangements mean for India's nuclear energy sector?

Kallol Bhattacharjee

#### The story so far:

**D**uring Prime Minister Narendra Modi's visit to Australia last week, India and Australia "finalised the administrative arrangements" required to enable export of uranium from Australia to India. These exports will be "exclusively for peaceful purposes and under International Atomic Energy Agency (IAEA) watch" under the Australia-India Nuclear Cooperation Agreement, 2015.

#### What does the latest development mean?

The finalisation of the "administrative arrangements" means that private Australian mining entities involved in uranium extraction will be able to conclude commercial contracts with Indian private sector companies and joint ventures. The participation of private

Indian entities in uranium exports from Australia adds a new chapter to India's energy journey, which was recently boosted by the SHANTI Act passed in December 2025, opening the nuclear sector to private players.

The timing of the announcement is significant, as it has come at a time when India's energy sector is under severe stress due to the U.S.-Israel attack on Iran. India is being forced to diversify and explore options to cope with short-term requirements by buying hydrocarbons from Russia, the United States, and Venezuela, while also planning for the future. The arrangements with Australia for uranium export are expected to help India meet its energy requirements in the future.

#### Why is this significant?

Australia holds more than a quarter of the global uranium reserves and has traditionally maintained a strict policy

regarding the supply or export of uranium to non-NPT member countries. According to the World Nuclear Association the countries that have received Australia's uranium include the United States, Japan, South Korea, France, Sweden, Belgium, Finland, the United Kingdom, and Germany. India is among the non-signatories, which are countries that chose not to sign the Nuclear Non-Proliferation Treaty.

Australia has been exporting uranium to countries with which it has "bilateral safeguards agreements", as it maintains that support for nuclear non-proliferation is among its "paramount" considerations. The "administrative arrangements" can be interpreted as further firming up of "bilateral safeguards" that were part of the Australia-India Nuclear Cooperation Agreement 2015.

India has an unblemished nuclear supply chain record and an ambitious nuclear energy programme. Though it is

not a signatory to the NPT, it signed a safeguards agreement with the IAEA in 2008 after India and the U.S. signed the nuclear deal, which was presided over by Prime Minister Manmohan Singh and President George W. Bush. Subsequently, the 48-member Nuclear Suppliers Group made a major move by exempting India from the list of countries with which they are prohibited from engaging in nuclear-energy-related business, thereby opening the gates for nuclear-energy-related supplies to India. This exemption has been the basis of several civil nuclear agreements that India has signed with partner countries.

#### What negotiations made this arrangement possible in 2026?

While Canberra and New Delhi have finalised the "administrative arrangements" now, negotiations between the two sides have been ongoing for nearly two decades. On November 12, 2009, during Prime Minister Kevin Rudd's visit to India, the two issues were addressed.

A joint statement issued during this visit said, "Mr. Rudd noted India's plans to meet its future energy requirements by exploring and developing all sources of energy, including nuclear, renewable and non-conventional resources. Both sides recognised the benefits of enhancing bilateral commercial exchanges of renewable and non-renewable energy

resources. The two Prime Ministers also agreed that energy security concerns are best met by reconciling the long-term interests of both energy-producing and energy-consuming countries through a truly open and competitive energy market. Both sides also expressed their willingness to join efforts which promote a cooperative response to any global energy crisis." The same joint statement also mentioned mutual commitment to oppose nuclear weapons. These negotiations led to the Australia-India Nuclear Cooperation Agreement, which was signed in 2014 and came into force in 2015.

According to World Nuclear Association, the "administrative arrangement" between India and Australia was "finalised and became operational" after the signing of the Australia-India Nuclear Cooperation Agreement of 2015 and at least 300 tonnes of uranium were exported to India since 2018.

But it is understood, that uranium export was part of a 'test drive' as there were lingering concerns about Indian entities receiving Australian uranium. The latest announcement on the "administrative arrangements" and the emphasis on "exclusively peaceful purposes and under International Atomic Energy Agency (IAEA) safeguards" indicates that the 'test run' has paved the way for bigger commercial deliveries.



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#### Detailed Points Analysis

#### 1. What is the meaning of the finalization of "Administrative Arrangements"?

- **Paving the way for commercial contracts:** Under this, Australia's private mining companies will now be able to enter into direct commercial agreements with India's private sector companies and Joint Ventures.
- **Entry of the private sector:** The SHANTI Act (Peace Act) passed by the Government of India in December 2025 has opened up India's nuclear sector to private companies. Uranium coming from Australia will now further strengthen this private participation.
- **End of the test phase (Test Drive):** Although around 300 tonnes of uranium was exported to India since 2018 following the 2015 agreement, it was like a 'test run'. Now, with the completion of the 'Administrative Arrangements', the way for large-scale commercial supply has been cleared.

#### 2. Its significance for India's nuclear energy sector

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- **Energy Diversification:** Currently, due to tensions in West Asia (such as the conflict between the US-Israel and Iran), global fuel supply has been affected. In such a situation, the uninterrupted supply of uranium for India makes nuclear energy a reliable alternative.
- **Meeting future energy demand:** India cannot rely solely on coal or hydrocarbons to meet the electricity requirements of its growing economy. This agreement will help increase clean and sustainable nuclear energy capacity.

### 3. Nuclear Non-Proliferation Policy and India's Global Credentials

- **Exemption despite being a non-signatory to the NPT:** Australia traditionally does not give uranium to countries that have not signed the Nuclear Non-Proliferation Treaty (NPT). India has not signed the NPT, yet this agreement by Australia recognizes India's "unblemished nuclear track record".
- **Bilateral Safeguards:** This supply will be entirely for peaceful purposes and will be under the strict monitoring of the International Atomic Energy Agency (IAEA).
- **Historical Context:** Following the India-US nuclear deal in the year 2008, the Nuclear Suppliers Group (NSG) gave a special exemption to India. Based on this exemption, India is able to sign civil nuclear agreements with several countries today, including Australia.

### 4. Background of the agreement and history of negotiations

- **Efforts of two decades:** This dialogue between the two countries has been going on for nearly 20 years. In the year 2009, during the visit of the then Prime Minister of Australia Kevin Rudd to India, consensus was reached on energy security and opposition to nuclear weapons.
- Following this, the 'India-Australia Nuclear Cooperation Agreement' was signed in 2014, which came into force in 2015, and now in 2026, its administrative rules have been finalized.

### Conclusion

The India-Australia uranium agreement is not just a commercial deal, but a symbol of the deep trust of the global community towards India. Amidst the Iran crisis and global geopolitical turmoil, this secure supply of uranium will help India keep its energy policies independent. Involving the private sector domestically through the 'SHANTI Act 2025' and ensuring fuel internationally from Australia—both these steps together will lead India towards a clean, self-reliant, and secure energy future. This partnership also gives a new dimension to the growing strategic relations between the two countries in the Indo-Pacific region.

### UPSC Mains Exam Study Questions

**Ques:** Briefly outline the role of civil nuclear cooperation agreements in strengthening India's energy security. **(10 Marks, 150 Words)**

## The right path for India's nuclear power development

**I**nternational sanctions were imposed on India after its peaceful nuclear test of 1974. The India-United States civil nuclear deal, which was signed in 2008, ended the restrictions on the import of uranium and of nuclear power plants, with some critical exceptions. The free import of natural uranium has enabled India to grow its nuclear programme. Negotiations with major western nuclear power plant suppliers were started but had to be given up as their plants were far too expensive.

### Homegrown nuclear advantage

Sanctions forced India to innovate. Every part going into India's nuclear plants was designed, developed, tested, and manufactured in India in patient partnerships between the Atomic Energy Commission (AEC) and Indian firms. The unit size of India's nuclear power plants went up from 200 MW to 500 MW. Now, 700 MW units have been developed. Four units are under construction and another 10 are being developed. India now makes the cheapest nuclear power plants in the world, costing approximately \$1,700 per Kw. The South Korean plants cost more, around \$2,200 per Kw, the French over \$5,500 per kw, and the U.S. \$15,000 per Kw. Therefore, India has the potential to become a major exporter of nuclear power plants.

With such a clear cost advantage and self-reliance, reports of plans to import nuclear power plants and technology indicate insufficient awareness of India's own capabilities and price competitiveness. The size of India's potential market for nuclear energy is so large that it would be rational for international suppliers to do whatever it takes to get a substantial share of this market. But would that be the optimum choice for India if costs are much higher or if it creates a new stream of technological vulnerability?

At this time, India has further strengthened its



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The country's nuclear future must balance growth with self-reliance and safety

leadership in technology as its 500 MW commercial fast breeder reactor is getting commissioned after overcoming many difficult challenges. Today, India makes Pressurised Heavy Water Reactors (PHWR), which use natural uranium as fuel. The Light Water Reactors (LWRs) use enriched uranium as fuel and are based on uranium enrichment technology which is more widely used in the world. India should try and develop its own LWRs, specially as the Nuclear Suppliers Group waiver permanently prohibits the transfer of enrichment and reprocessing technology to India. This should not be beyond India's capabilities, given sufficient resources and a dedicated programme.

### Scaling up, staying self-reliant

The government has decided that by 2047, India will develop 100 GW of nuclear power capacity. To achieve this, the sector has been opened up to new entrants from both the public and private sectors through enabling legislation that is well-crafted and investor-friendly. The price of nuclear power in India is now competitive vis-à-vis thermal power. The use of the proven, cost-competitive domestic technology by new entrants would be the ideal cost-effective way to scale up. A large programme has scale effects resulting in lower production costs. Further, new entrants could potentially reduce project execution costs and time. Bringing in technology streams and equipment which will give India far more expensive electricity should not merit serious consideration.

To meet the enormous dedicated power demands of artificial intelligence data centres, small modular reactors (SMRs) are being considered as a solution in the West. However, the designs remain under development, with commercial deployment yet to begin. The AEC has offered its technology for 200 MW nuclear

plants to new entrants. Smaller unit sizes to suit emerging market needs can also be developed domestically in partnership between the AEC and Indian firms. The market for SMRs in India would be a bilateral contractual matter between the generator and buyer. From a regulatory perspective, there would be merit in taking the view that a foreign-designed SMR plant should have operated satisfactorily for a few years before being deployed in India. There would be little justification for an untested SMR being developed elsewhere being first deployed, experimentally, in India.

### Ambition needs caution

Given the critical importance of ensuring the safety of nuclear power plants, it would be prudent that new players establish themselves before scaling up. India's record on safety in its nuclear plants has been exemplary till now. This must be preserved going forward. This will be a major challenge amid rapid expansion and the entry of new players, given the prevailing industrial culture in India, where accidents at construction sites and operating industrial plants continue to occur.

A single nuclear mishap could trigger a strong public backlash, similar to the one experienced by the West after Chernobyl (1986), which led to nuclear power development coming to a virtual standstill in many western countries. It would, therefore, be prudent for new entrants to initially develop only a few plants and establish the rigorous internal safety culture required for nuclear facilities, subject to continuous external auditing. Scaling up can thereafter take place gradually, without needlessly risking safety. The goal of achieving 100 GW of capacity by 2047 could be achieved safely while also strengthening self-reliance within India and enabling the country to become a globally competitive player.

### GS Paper II& III: International Relations and Science & Technology

**UPSC Mains Exam Practice Questions:** "The international sanctions imposed after 1974 proved to be a catalyst for self-reliance in India's nuclear sector." Critically analyze this statement.(10Marks, 150 Words)

**Context :**After the 1974 nuclear test, India faced harsh international sanctions for decades. These sanctions forced India to become self-reliant, resulting in the country developing indigenous nuclear technology. The 2008 India-US Civil Nuclear

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Agreement opened the doors for uranium imports for India. Currently, the Government of India has set an ambitious target of achieving 100 GW (gigawatt) of nuclear power capacity by the year 2047. This analysis evaluates India's nuclear journey, its global cost-competitiveness, new technologies (such as SMR), and the challenges arising along this path.

### Key Points

#### 1) Homegrown Advantage & Cost Competitiveness

- **Positive Impact of Sanctions:** Due to international sanctions, India's Atomic Energy Commission (AEC) and domestic companies collaborated to build nuclear reactors indigenously.
- **Increase in Capacity:** India has increased its reactor capacity from 200 MW to 500 MW and now to 700 MW (PHWR - Pressurised Heavy Water Reactors).
- **Cheapest Globally:** India builds the cheapest nuclear power plants in the world. India's cost is ~\$1,700 per kilowatt (Kw), compared to \$2,200 for South Korea, \$5,500 for France, and \$15,000 per kilowatt for the US. Due to this, nuclear power prices in India have become as competitive as coal (thermal) based power.
- **Export Potential:** Due to low cost and high efficiency, India can become a major global exporter of nuclear reactors in the future.

#### 2) Self-Reliance vs Foreign Imports

- **Logical Opposition to Imports:** When India possesses its own cheap and safe technology, plans to import expensive foreign reactors or technologies could affect India's self-reliance and economic interests.
- **Technical Sensitivity:** The Nuclear Suppliers Group (NSG) waiver rule permanently bans the transfer of 'Enrichment and Reprocessing' technology to India.
- **Future Strategy:** India should focus on developing its own Light Water Reactors (LWR) running on enriched uranium, rather than depending on foreign imports. Along with this, India's 500 MW commercial Fast Breeder Reactor is also on the verge of becoming operational, showcasing India's technological edge.

#### 3) Scaling Up & Private Sector Entry

- **Legal Reforms:** To achieve the 100 GW target by 2047, the government, through new laws, has opened up this sector for new public and private sector players (New Entrants).
- **Economies of Scale:** Large-scale utilization of domestic technology will further reduce production costs. Additionally, private sector participation will help complete projects on time and reduce execution costs.

#### 4) Small Modular Reactors (SMR) and Caution on Foreign Technology

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- **Demand for SMR:** There is talk of 'Small Modular Reactors' (SMR) in the West to meet the massive electricity demand of Artificial Intelligence (AI) and data centers.
- **India's Stance:** The Atomic Energy Commission (AEC) is already offering its 200 MW technology to new entrants. India should develop small reactors domestically instead of relying on foreign designs.
- **Regulatory Caution:** Any foreign SMR should be allowed in India only if it has operated successfully abroad for a few years. India should not become an experimental ground for any untested technology.

### 5) The Critical Challenge of Safety

- **Excellent Record:** So far, the safety record of India's nuclear plants has been exemplary.
- **Concerns over Domestic Industrial Culture:** In India, accidents frequently occur at general construction sites and industrial plants. In such an environment, maintaining safety with the entry of new players in the nuclear sector will be a major challenge.
- **Lesson of Chernobyl:** After the 1986 Chernobyl disaster, the development of nuclear energy halted in the West. A single nuclear accident in India could incite public outrage against the entire program.

### Conclusion

The future of India's nuclear energy sector hinges on a balance between indigenization and extreme caution. Global leadership in terms of cost and a robust safety record are India's biggest assets. To achieve 100 GW capacity by 2047, new private and public partners are welcome, but they must first prove their capability on a smaller scale without compromising safety. Instead of getting caught in the trap of expensive foreign imports or untested SMR technologies, India must leverage its domestic capability (PHWR and Fast Breeder). Only by developing a strict external audit and a strong internal safety culture can India become a global superpower in the clean energy sector while remaining self-reliant.