

Aatmanirbharta in Urea Production

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Executive Summary

1. India stands at a critical juncture in its journey towards self-reliance in urea production. The country remains dependent on imports, making it vulnerable to global supply shocks, and price fluctuations.
2. Achieving **aatm nirbharta in urea by 2025** is not just an economic necessity but a strategic imperative for ensuring food security and agricultural resilience. To break free from import reliance, India must **revolutionise the fertiliser industry**.
3. A shift towards sustainable and efficient urea production will reduce carbon emissions and optimise resource use, ensuring long-term agricultural productivity and aligning with the SDGs. The main focus is to achieve the aim with more sustainability and less cost.
4. Beyond production, **reforms** in subsidy distribution, infrastructure investment, and policy frameworks are crucial to correcting market distortions, encouraging responsible fertiliser use, and continuously updating the reforms to keep **pace with time**.
5. The future of India's agricultural economy depends on **innovation, efficiency, and strategic investment**, making 2025 a defining moment in our pursuit of self-sufficiency in urea production.

I. Introduction:

Urea is a nitrogen-dense organic chemical most commonly employed as **a fertiliser containing roughly 46% nitrogen**, crucial to plant development. It acts as an essential nitrogen source that favours the creation of chlorophyll, synthesis of proteins, and photosynthesis, resulting in robust plants and better yields. Urea helps leaf and stem growth and gets assimilated effortlessly once it turns into ammonium and nitrate.

Agriculture is the backbone of the Indian economy, the mainstay of nearly 70% of the population. **India, the second largest producer and consumer of urea**, must reduce its dependence on the world, especially after the Russian-Ukrainian crisis, unsettlement in the East and sanctions imposed by America. Any shortfall in supply or increase in the price of critical inputs like fertilisers is bound to harm the overall economic performance of our rural sector. To achieve the goals of the FY2025 budget, we must focus on two key objectives: First, transforming India into the **“food basket of the world”** through equitable resource distribution. Second, achieving **“aatma nirbharta” (self-sufficiency) in urea production** is crucial; without it, the first goal cannot be met. Achieving self-sufficiency in urea could save the government nearly Rs 40,000 crore, bolstering our agricultural resilience and fueling sustainable growth.

II. Details:

A. Urea Production in India: India's urea sector has witnessed significant shifts over the years, reflecting changes in demand, domestic production capacity, import dependency, and policy interventions. Over the past six years, India has witnessed a steady **rise in urea consumption**, necessitating an increase in domestic production and a strategic reduction in imports. Consumption has grown **from 320.04 LMT (2018-19) to 357.81 LMT (2023-24)**, reflecting the expanding demand in agriculture. To address this, domestic production has significantly increased from 238.99 LMT to 314.09 LMT during the same period, reducing reliance on imports, which peaked at 98.28 LMT in 2020-21 but declined to 70.42 LMT in 2023-24. This shift highlights India's

efforts toward self-sufficiency in fertiliser production, driven by policy interventions, infrastructure expansion, and sustainability initiatives.

Consumption of Urea	
Year	Consumption in 'LMT'
2018-2019	320.04
2019-2020	336.96
2020-2021	350.51
2021-2022	341.73
2022-2023	357.26
2023-2024	357.81

Table 1: Year-wise Urea consumption in India

(LMT: Lakh Metric Tonnes)

Insights: Urea consumption in India has risen from 320.04 LMT in 2018-19 to 357.81 LMT in 2023-24, showing an overall increasing trend despite minor fluctuations. The highest usage was recorded in 2023-24 (357.81 LMT), indicating growing agricultural demand. This trend highlights the need for policies promoting sustainable fertiliser use, enhanced domestic production, and balanced subsidy management to ensure affordability while mitigating environmental impacts. Strengthening alternative nutrient solutions and efficient resource utilisation will be crucial for long-term agricultural sustainability.

Production of Urea	
Year	Production(in LMT)
2018-2019	238.99

Production of Urea	
2019-2020	244.58
2020-2021	246.05
2021-2022	250.72
2022-2023	284.94
2023-2024	314.09

Table 2: Year-wise Production of Urea in India

Insights: India's urea production has steadily increased from 238.99 LMT in 2018-19 to 314.09 LMT in 2023-24, reflecting a significant rise in domestic capacity. The most notable growth occurred after 2021-22 (250.72 LMT), with sharp increases in 2022-23 (284.94 LMT) and 2023-24 (314.09 LMT). This upward trend indicates efforts to enhance self-sufficiency and reduce import dependency through policy support and expanded manufacturing infrastructure.

Import of Urea	
Year	Imports (in LMT)
2018-2019	74.81
2019-2020	91.23
2020-2021	98.28
2021-2022	91.36
2022-2023	75.80
2023-2024	70.42

Table 3: Year-wise Import of Urea in India

Insights: India's urea imports fluctuated over the years, peaking at 98.28 LMT in 2020-21 before gradually declining to 70.42 LMT in 2023-24. **The sharpest drop occurred after 2021-22 (91.36 LMT), indicating a possible shift towards increased domestic production or alternative fertilisers.** The declining trend suggests efforts to reduce import dependence, likely through policy interventions and capacity expansion in domestic urea manufacturing.

India's urea industry has experienced a drastic change, characterised by growing consumption, augmenting domestic production, and a significant decline in imports. The consistent increase in urea consumption (357.81 LMT during 2023-24) underscores the industry's growing demand, while domestic production (314.09 LMT during 2023-24) indicates fruitful policy initiatives for reaching self-sufficiency. The decrease in imports (from 98.28 LMT during 2020-21 to 70.42 LMT during 2023-24) reflects lower external dependence, enhancing India's fertiliser security. In the future, pursuing this momentum means ongoing investment in local manufacturing, balanced fertiliser consumption, and eco-friendly practices to aid long-term agricultural development.

B. Schemes for Urea Production in India:

- 1. Urea Subsidy Scheme:** The Urea Subsidy, which has been treated as a non-plan expenditure since its inception, is part of the Central Sector Scheme of this Department. The scheme is wholly financed by the Government of India through Budgetary Support. The Urea Subsidy Scheme has two components, i.e., **Indigenous Urea** and **Imported Urea**. Indigenous Urea in turn comprises indigenous urea subsidy administered to the urea units. Imported Urea subsidy is directed towards imports to bridge the gap between assessed demand and indigenous urea production in the country.
- 2. New Investment Policy (NIP)-2012:** Announced on 2nd January 2013, and its amendment on 7th October 2014, aimed to facilitate fresh investment in the urea sector and to make India self-sufficient in the urea sector. Under NIP-2012 with its amendment, Matix Fertilizers and Chemicals Ltd.(Matix), Chambal Fertilizers and Chemicals Ltd. (CFCL), Ramagundam Fertilizers and Chemicals Ltd.(RFCL) and Hindustan Urvarak & Rasayan Limited (HURL) have **set up urea plants of 12.7 Lakh Metric Ton per annum (LMTPA)** capacity each at Panagarh-West Bengal, Gadepan-Rajasthan (Gadepan-III), Ramagundam-Telangana and Gorakhpur-Uttar Pradesh respectively.¹
- 3. New Urea Policy(NUP)-2015:** The objective of maximising Indigenous urea production; promoting energy efficiency in urea production; and rationalising the subsidy burden on the Government. The implementation of NUP-2015 has led to additional production from the existing gas-based urea units due to which the actual production of urea has increased by 20-25 LMTPA in comparison to the actual production during 2014-15.²
- 4. Neem-Coated Urea:** The Department of Fertilisers (DoF) has made it **mandatory for all domestic producers to produce 100% urea as Neem-Coated Urea (NCU)**, to improve soil health and reduce the usage of plant protection chemicals etc.

¹ [Press Release:Press Information Bureau](#)

² [Press Release:Press Information Bureau](#)

5. **Nano Urea:** The Government of India has notified the specifications of Nano Urea under the Fertiliser Control Order, 1985. Nano Fertilisers hold great promise for application in plant nourishment because of their size-dependent qualities, high surface-to-volume ratio and unique optical properties.
6. **Urea Gold:** The Department of Fertilizers introduced **Sulphur-Coated Urea (SCU)** i.e. “Urea Gold” after Cabinet approval. SCU has better nitrogen use efficiency as compared to Neem Coated Urea. SCU would ensure reduced water pollution and salt index, prevent soil compaction and improve crop quality and yields

II. Analysis

Despite the government’s concerted efforts to make India *aatma nirbhar* in urea production, including the introduction of various initiatives like Nano urea production, Neem coating of urea, New Urea Policy 2015, New Investment policy-2012, the Nutrient-Based Subsidy Scheme, substantial challenges exist. The agricultural sector, a primary contributor to India’s economy and the livelihood of the majority of its population, remains highly vulnerable to external and internal pressures. These challenges are exacerbated by the unpredictable nature of agriculture, a sector reliant on natural resources and subject to fluctuating market conditions. The **challenges include:**

- A. **High Production Costs and Infrastructure Issues:** Poor infrastructure and high production costs impede progress, making it essential to invest in modern facilities and efficient logistics to enhance productivity and competitiveness.
- B. **The mindset of Traditional Farming:** Most farmers prefer to maintain traditional ways instead of modernising. They are reluctant to use modernised methods as their sole source of livelihood. Limited access to technology, lack of proper training, and fear of financial risks contribute to this resistance. **Promoting farmer education** and providing **financial incentives** can help ease the transition to modern agricultural practices.
- C. **Price Differentials:** The subsidised price of urea makes farmers **over-depend on it** as against other fertilisers, which they find expensive to use. This imbalance leads to the overuse of urea, depleting soil health and reducing long-term agricultural productivity. Encouraging balanced fertilisation through awareness programs and incentive-driven policies is crucial for sustainable farming.
- D. **Cost of Nano Urea:** Liquefied nano urea is **more expensive** than normal urea, and there is insufficient production and risk management for nano fertilisers in the country. **Limited awareness** and **inadequate research** on its long-term impact further hinder its large-scale adoption. Strengthening production capabilities and establishing safety regulations will be crucial for its effective integration into Indian agriculture.
- E. **Energy Security Challenges:** Dependence on urea and natural gas imports poses vulnerabilities, brought to the fore, especially during **the Russian-Ukrainian war**. Indirectly, it makes India’s agricultural sector reliant on foreign nations.
- F. **Unbalanced Fertiliser Consumption:** Fertiliser applications are unevenly distributed throughout the nation. Some regions consume more than the required quantity reducing the availability for regions where basic consumption needs are not met.

III. Recommendations

To accomplish the goal of *aatma nirbharta* in urea production by 2025, the following recommendations should be implemented to address the challenges:

- A. Promoting the production of Green Urea: Decarbonisation of urea** into other forms like green urea, which uses **green hydrogen via renewable energy** sources instead of the traditional method of producing **grey urea, derived from natural gas** and fossil fuels that emit large amounts of carbon dioxide. Promotion can be done by the central government or state governments by subsidising the materials/resources required for green urea production. Consider **de-regulating urea pricing** over time to allow market forces to drive more efficient pricing, with the long-term goal of aligning urea pricing with environmental sustainability.
- B. Adopting Efficient and Effective Process:** The focus of the government should be to **modernise older plants** using advanced technologies. These processes are seen as solutions to reduce costs, minimise environmental impact, and improve the overall sustainability of urea production in India.
- 1. Kellogg Brown & Root (KBR)-** The process involves separating unreacted ammonia and carbon dioxide, recycling them to achieve the correct NH_3/CO_2 mole ratio, and generating low-pressure steam. Older KBR's Weatherly urea plants have been redesigned for increased production.
 - 2. Stamicarbon processes -** The technology uses advanced reactor designs and energy-saving features to improve operational efficiency and reduce emissions in urea production, transforming ammonia and carbon dioxide into high-quality urea melt.
- C. Revival of closed units:** Such as that of Durgapur and Haldia units of HFCL, which will save the finance in setting up a new manufacturing unit and that saved money could be used to equip the unit with the technologies and machinery necessary.
- D. Infrastructural Development:** Establishing production hubs in regions where green hydrogen is readily available along with easy access to renewable energy, to lower production costs, support sustainable use and support localised supply chains.
- E. Establish a Fertiliser Innovation Hub under the Council of Scientific & Industrial Research (CSIR):** With a focus on the development and availability of green urea technologies across the countries to overcome challenges of regional disparities in terms of urea availability, it is important to create a particular department/hub attributed to the fertiliser sector.
- F. Establish a Fertilizer Infrastructure Fund:** Create a dedicated fund under the Ministry of Chemicals and Fertilizers to finance the construction of new urea plants and the modernisation of old urea plants. This fund should **support both public and private sector investments** in new projects, especially in regions lacking sufficient urea production, and setting up the supply chain required for manufacturing and transportation.
- G. Optimising Input Use: Promoting Efficiency and Sustainability:** Enacting policies to discourage prolific and indiscriminate use of fertiliser, and promote its optimum use- like that of Fertilizer Control Order (FCO)-1985 has laid down fertilizer-wise detailed specifications. Any fertiliser, not meeting the said specifications, cannot be

sold in the country for agricultural purposes. **Clause 19 of FCO** strictly prohibits the sale or manufacture of fertilisers which are not of prescribed standards.

- H. Enhanced Nitrogen Management for Agricultural Efficiency:** Providing incentives for technologies that allow for the extended release of nitrogen into the soil over a longer period, reducing nitrogen losses and ensuring that crops receive the necessary nutrients and their promotion and training programmes for farmers on how to use it. This could lead to **higher yields**, such as more grains per cob in the case of maize.
- I. Universalising Direct Benefit Transfer for Agricultural Inputs:** Expand the Direct Benefit Transfer (DBT) system for fertiliser subsidies to ensure transparency and non-payment due to lack of information. Direct cash transfers to farmers based on actual fertiliser consumption would help streamline **access to subsidies, reduce market distortions, and ensure equitable distribution of resources.**
- J. Protection of Indigenous Urea Plants:** By introducing tariffs and anti-dumping duties on urea imports to prevent unfair competition from urea imports, to ensure that domestic production is not overpriced and to encourage local supply. The Talcher project should be expedited and used as a model for scaling up self-reliant fertiliser production.
- K. Policies should be Updated:** The government should regularly review and update its policies to address the evolving challenges in the fertiliser sector, including revising regulations, introducing corrective mechanisms, and reassessing mineral mine allocation for Public Sector Undertakings, to ensure a stable supply chain.
- L. Budget Allocation:** Concern over the reduction in budget allocations for fertiliser subsidies should be addressed. The government should ensure accurate budget estimates and timely allocation of funds to avoid disruptions in subsidy payments. A review of the urea import strategy is necessary to avoid excessive imports and financial burden.
- M. Drone Monitored Usage for Fertilizer Application:** The drone distribution under the **Namo Drone Didi (NDD) Scheme** should be accelerated. Fertiliser PSUs should be encouraged to use CSR funds to expand drone distribution. Alternative, cost-effective methods for nano fertiliser application should be explored for small and marginal farmers.

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