



## Costly Fertilisers: Rethink Consumption

This editorial is based on [“The fertiliser Pinch”](#) which was published in The Indian Express on 24/06/2022. It talks about the need to cap India’s consumption of fertilisers due to rising global prices.

**For Prelims:** Agriculture, Cropping pattern, fertilisers, Science behind fertilisers, Related Initiatives

**For Mains:** Importance of Agriculture, Economics of fertilisers, Science of fertilisers, Impact of fertilisers, Government’s Initiative

**Fertilisers** are any material of natural or synthetic origin that is applied to soil or to plant tissues to supply plant nutrients.

India is facing the challenge of meeting its requirement of fertiliser due to disruption in supply chain and increase in price of fertilisers.

No country has as much area under farming as India. At 169.3 million hectares (mh) in 2019, its land used for **crop cultivation** was higher than that of the US (160.4 mh), China (135.7 mh), Russia (123.4 mh) or Brazil (63.5 mh). India has a legacy of having no dearth of land, water and sunshine to sustain vibrant agriculture.

But there’s one resource in which the country is short and heavily import-dependent — Mineral Fertilisers.

India is heavily dependent on imports for fertilisers. In Fiscal Year 2021-22, imports of all fertilisers touched an all-time high of \$12.77.

In this context, India today needs to cap and reduce the consumption of fertilisers and reduce its import bill.

### What are Different Kinds of Fertilisers?

#### ▪ Urea:

- Urea fertiliser is majorly obtained from **Natural Gas**.
- Since the basic component of natural gas is **methane**, one can easily obtain **hydrogen** by subjecting natural gas into a reaction called "steam reforming".
  - Once we obtain hydrogen, we can react with nitrogen to obtain **ammonia**, which can be used alone as a fertiliser or reacted with carbon dioxide to obtain urea fertiliser.

#### ▪ Di-ammonium phosphate(DAP):

- **DAP** is the second most commonly used fertilisers in India after urea.
- DAP (46% Phosphorus, 18% **Nitrogen**) is the preferred source of Phosphorus for farmers.

This is similar to urea, which is their preferred nitrogenous fertiliser containing 46% N.

▪ **Muriate of Potash:**

- Muriate of potash, also known as potassium chloride contains 60% potash. Potash is essential for plant growth and quality. It plays a vital role in the production of proteins and sugars.

## How much does India Imports?

▪ **Imports of Direct Use:**

- In 2021-22, India imported total of 18.93 mt of fertilizers ( \$12.77 billion)

▪ **Imports of Raw Material:**

◦ **Urea:**

- Urea's primary feedstock is Natural Gas.
  - In 2021-22, India imported 23.42 mt of [Liquefied Natural Gas](#) (LNG) (\$13.47 billion).
  - As per the [Ministry of Petroleum and Natural Gas](#)'s data, the fertiliser sector's share in the consumption of re-gasified LNG was over 41%. The industry's LNG imports would have, then, been worth more than \$5.5 billion.

◦ **Di-Ammonium Phosphate:**

- Domestic manufacturers import intermediate chemicals, namely phosphoric acid and ammonia. Some even produce phosphoric acid by importing rock phosphate and sulphuric acid.
  - Phosphoric Acid can be made from the import of sulphur.

◦ **Others:**

- 8.33 mt of complex fertilisers (containing nitrogen-N, phosphorus-P, potassium-K and sulphur-S in different ratios).

## What are the Challenges Faced by India?

▪ **Rise in Global Prices:**

- India is facing the challenge of meeting its requirement of fertiliser supply which has been disrupted ahead of kharif sowing in the wake of [Russia's invasion of Ukraine](#).
  - Russia is a major exporter of natural gas and supplied almost a third, or 32%, of the gas consumed in the European Union (and the U.K.) in 2021.
    - Sanctions on Russia have stopped much of this from getting out.
    - Natural Gas derived Urea's supply has been disrupted majorly in the wake of Russia's invasion.

▪ **Increase in Demand of Fertilisers:**

- The agricultural output of India has increased every year, and the country's need for fertilisers has also increased.
- Despite imports, gaps remain between requirements and availability after indigenous production targets haven't been met.
- Demand has increased, but supply has been constrained.

▪ **Fertiliser Subsidy:**

- The government pays a [subsidy](#) to fertiliser producers to make this critical ingredient in agriculture affordable to farmers.
- This allows farmers to buy fertilisers at below-market rates.
  - The difference between the cost of production/import of a fertiliser and the actual amount paid by farmers is the subsidy portion borne by the government.
- **Subsidy on Urea:**
  - The Centre pays subsidy on urea to fertiliser manufacturers on the basis of cost of production at each plant and the units are required to sell the fertiliser at the government-set **Maximum Retail Price (MRP)**.
- **Subsidy on Non-Urea Fertilisers:**
  - The MRPs of non-urea fertilisers are decontrolled or fixed by the companies. The Centre, however, pays a flat per-tonne subsidy on these nutrients to ensure they are priced at "reasonable levels".
  - **Examples of non-urea fertilisers:**
    - Di-Ammonium Phosphate (DAP), Muriate of Potash (MOP).

### ▪ **Impact of Pandemic:**

- The pandemic has impacted fertiliser production, import and transportation across the world during the last two years.
- China, who is the major fertiliser exporter, has gradually reduced their exports in view of a dip in production.
  - This has impacted countries such as India, which sources 40–45% of its phosphatic imports from China.

## **What are the Initiatives Taken by India to Address the Issue?**

### ▪ **Neem Coating of Urea:**

- The Department of fertilisers (DoF) has made it **mandatory for all the domestic producers to produce 100% urea** as Neem Coated Urea (NCU).
- The benefits of NCU are:
  - Due to slow release of Nitrogen, Nitrogen Use Efficiency (NUE) of Neem Coated Urea increases, resulting in reduced consumption of NCU as compared to normal urea.
  - Improvement in soil health.
  - Reduction in usage of plant protection chemicals.
  - Reduction in pest and disease attack.

### ▪ **New Urea Policy (NUP) 2015:**

- Objectives of the policy are-
  - To maximize indigenous urea production.
  - To promote energy efficiency in the urea units.
  - To rationalize the subsidy burden on the Government of India.

### ▪ **New Investment Policy- 2012:**

- The Government announced New Investment Policy (NIP)-2012 in January, 2013 and made amendments in 2014 to facilitate fresh investment in the urea sector and to make India self-sufficient in the urea sector.

### ▪ **Use of Space Technology in Fertiliser Sector:**

- Department of fertilisers commissioned a three year Pilot Study on “**Resource Mapping of Rock Phosphate using Reflectance Spectroscopy and Earth Observations Data**” by National Remote Sensing Centre under ISRO, in collaboration with Geological Survey of India (GSI) and the Atomic Mineral Directorate (AMD).

### ▪ **The Nutrient Based Subsidy (NBS) Scheme:**

- It has been implemented from April 2010 by the DoF.
- Under **NBS**, a fixed amount of subsidy decided on an annual basis, is provided on each grade of subsidized Phosphatic & Potassic (P&K) fertilisers depending on its nutrient content.
- It aims at ensuring the balanced use of fertilisers, improving agricultural productivity, promoting the growth of the indigenous fertilisers industry and also reducing the burden of Subsidy.

## **What Should be India’s Approach Going Forward?**

### ▪ **Urease and Nitrification:**

- Incorporating urease and nitrification inhibition compounds in urea.
- These are basically chemicals that slow down the rate at which urea is **hydrolysed** (resulting in the production of ammonia gas and its release into the atmosphere) and **nitrified** (leading to below-ground loss of nitrogen through leaching).
- By reducing ammonia volatilisation and nitrate leaching, more nitrogen is made available to the crop, enabling farmers to harvest the same, if not better, yields with a lesser number of urea bags.

### ▪ **Other Methods:**

- Promoting sales of Single Super Phosphate SSP (containing 16% Phosphorus and 11% Sulphur) and complex fertilisers
- India can also import more rock phosphate to make SSP directly or it can be converted into “weak” phosphoric acid, which can be used to manufacture complex fertilizer.
- DAP use should be restricted mainly to paddy and wheat, other crops don’t require

fertilisers with 46% Phosphorus content.

- Regarding MOP, roughly three-fourths of the imported material is now applied directly and only the balance is sold after incorporating into complexes. It should be the other way around.

▪ **Moral Suasion:**

- India needs to wean its farmers away from all high-analysis fertilisers.
- It requires a concerted push, alongside popularizing high nutrient, use-efficient, water-soluble fertilisers (potassium nitrate, potassium sulphate, calcium nitrate, etc) and exploiting alternative indigenous sources (for example, potash derived from molasses-based distillery spent-wash and from seaweed extract).
- No plan to cap/reduce consumption of high-analysis fertilisers can succeed without farmers knowing what is a suitable substitute for DAP and which NPK complex or organic manure can bring down their urea application from 2.5 to 1.5 bags per acre.

***Drishti Mains Question***

India's agriculture sector is hampered by the double edged sword of high demand of fertilisers and global rise in their price. Discuss.