THE INDIA FORUM
A JOURNAL-MAGAZINE ON CONTEMPORARY ISSUES

May 9, 2022

A Looming Crisis in Fertilisers

By: M.P. Sukumaran Nair

India needs to urgently take measures to improve fertiliser availability in the short and long term. The absence of major investments since the 1990s, and now the Ukraine war and the Chinese ban on exports, have created a difficult situation amidst a global imbalance.

A spurt in demand for fertilisers after the pandemic from most major crop producing countries, including the United States (US), the European Union (EU), Brazil, China, and India, has upset the global availability and prices of mineral fertilisers. An increase in the price of natural gas, the Chinese government's ban on the export of fertilisers, and the Ukraine war have reduced the production and movement of fertilisers at the onset of the sowing season in different parts of the world.

As Svein Tore Holsether, president and CEO of Yara International, one of the world's biggest fertiliser companies that operates in more than 60 countries, commented, the Ukraine war is going to have a catastrophic impact on the already challenged global food production system due to climate change, growing populations, and the pandemic, which may result in a massive increase in food insecurity in poorer countries.

India's food grain production touched a remarkably high 308.65 million tonnes during 2020-21. Almost 50% to 55% of the additional grain production is directly contributed to the application of mineral fertilisers, which played a major role in the success of India's green revolution and helped the country attain food self-sufficiency. As a result, since then, the demand for fertilisers has witnessed significant year-to-year growth rates over several years. The domestic industry has expanded and also led to huge imports of products and inputs that are not domestically available.

Present situation

Today India is the second-largest fertiliser-consuming country, the third-largest producer, and the world's largest importer of fertiliser materials — nitrogen (N), phosphate (P_2O_5) and potash (K_2O). Still, the per hectare application of mineral fertilisers in India remains much lower than in most of the developed and emerging economies.

India Fertiliser Scene, 2020-21	
World's 2nd largest consumer	32.55 MMT (N+P_2O_5+ K_2O)
World's 3rd largest producer	18.48 MMT (N+P_2O_5)
World's largest importer	10.90 MMT (N+P_2O_5+ K_2O)

Nutrient	Production	Import	Consumption* (MMT)
N	13.74	5.66	20.41
P_2O_5	4.74	2.55	8.98
K_2O	-	2.69	3.16
Total	18.48	10.90	32.55

Source: All figures are from publications of the Fertiliser Association of India, FAI)

Note: * Higher consumption is made up from available inventory.

Data from the Fertiliser Association of India (FAI) show that in the last 30 years, consumption of fertiliser materials was growing at a compound annual growth rate (CAGR) of 3.3% whereas production grew only by 2.18%. This has necessitated huge imports, which grew at an astonishing 5.81% (barring potash, which needs to be imported as we have no domestic resources) during the same period. In the last decade since 2011-12, production grew only by 1.13% CAGR.

In 2016, the Narendra Modi government decided to revive five closed down public sector urea production units at Ramagundam, Talcher, Gorakhpur, Sindri, and Baruni. The situation is likely to get better with the commissioning of the five brownfield urea plants now under construction. This may happen by the end of 2024. Once these units become fully operational, they will supply around 63.5 lakh MT of urea, which will substantially reduce its import. There will also be better domestic availability once the coal bed methane supply to the Matix urea plant in West Bengal is streamlined[1] and Paradeep Phosphate expands production of diammonium phosphate/nitrogen phosphorus (DAP/NP). Taking all things together, we find that ensuring the ready availability of fertilisers will mean imports continuing unabated at least in the near term.

Imports: Country of origin

During 2020-21, India imported 203.3 lakh MT of fertiliser materials. China, Oman, Egypt, Ukraine, the UAE, and Indonesia supplied 98.3 lakh MT of urea. We also imported 48.8 lakh MT of phosphatic fertilisers from Saudi Arabia, Morocco, China, Russia, and Jordan and 13.9 lakh MT complex fertilisers, mostly from Russia, Indonesia, and Saudi Arabia. As for potash, the imported quantity during 2020-21 was 42.3 lakh MT, mostly from Canada, Belarus, Russia, Jordan, Lithuania, and Israel.

Coming to fertiliser intermediates, during 2020-21, India imported 24.16 lakh MT of ammonia from Saudi Arabia, Qatar, Ukraine, Egypt, Turkey, Indonesia, Iran, and Oman. India also imported 25.1 lakh MT of phosphoric acid during the same year from Morocco, Jordan, Senegal, and Tunisia. Apart from the above, during the same year, India imported 77.34 lakh MT of rock phosphate and 14.63 lakh MT of sulphur for use in fertiliser plants. Most of the rock phosphate was imported from Jordan, Morocco, and Egypt and sulphur from Qatar, the UAE, and Oman.

Evolution of the crisis

Following the retention pricing policy (RPS) and the encouragement given to public and private companies in the 1980s and up to 1995, the country attained self-sufficiency in urea production in 2000. During this period, fertiliser production, which was mostly a public sector manufacturing activity, slowly drifted towards the private sector following a lack of expansion of public sector units and also due to the closure of some of the operating units.

In the wake of liberalised economic policies, it was decided that no major government investment was needed in the public sector. Due to this change in government policy, there have been no major new investments since 1995 in the fertiliser sector. Since then, imports have increased by leaps and bounds to satiate farmers' demand. In the meantime, in 2002, several plants, which operated on coal, naphtha, fuel oil, and lignite, were closed down because of high specific energy consumption and the increased cost of production. This also reduced the domestic availability, leading to higher imports.

Joint ventures

In early 2000, the Indian government encouraged fertiliser units to put up manufacturing facilities abroad — where raw material was cheap —and bring the fertilisers to India. Subsequently, two ammonia /urea plants (9 lakh MT) were installed in Oman through a joint venture (JV) with IFFCO. Four phosphoric acid plants (a total of 18.15 lakh MT) were also commissioned in subsequent years through JVs involving Jordan, Morocco, Tunisia, and Senegal. The products from these units were exported to India. One of the JVs involving Jordan's JPMC and SPIC, Tuticorin, to produce phosphoric acid, was dissolved in 2010. It thereafter became a fully owned subsidiary of JPMC. However, efforts to procure and develop potash mines abroad have not borne fruit.

During the last two decades, the fertiliser policy has been tinkered with several times, but none of it has been able to infuse new investments in the sector or reduce the subsidy burden on the government. Some of the major private players in the fertiliser business have also left the scene on account of the government's unfriendly policies. The inordinate delay in the disbursement of subsidies had hit them hard. With the partial decontrol of pricing and introduction of nutrient-based pricing in 2008, the farm-gate price of phosphatic and potassic fertilisers went up sharply, severely straining farmers.

The government's efforts to attain better nutrient use efficiency of applied fertilisers in the field, based on nationwide soil testing and balanced administration of fertilisers, has not gathered momentum. Promoting the large-scale use of compost and farmland manure bio-fertilisers, fortified fertilisers, and micronutrients has also not succeeded as intended. Though the sector underwent all the strains associated with the neoliberal policies of the government, it has not been able to transform itself by absorbing new trends, scientific advancements, and strategies that have occurred in the production, crop nutrition and use of mineral fertilisers around the world.[2]

Energy price rise since 2021

Globally gas prices have been on an increasing trend since June 2021 due to the demand surge post-Covid-19. Consequently, international fertiliser prices have also been hardening. Early in January 2022, ammonia prices ruled as high as $990 per MT, compared with under $300 per MT a year ago. A similar increase in prices was seen in the case of urea and DAP, major fertiliser materials imported to India.

The price of natural gas produced by Oil and Natural Gas Corporation (ONGC) fields, which is used to make fertilisers, generate electricity, and provide compressed natural gas (CNG) for automobiles, is revised every six months by the government. A 62% hike was imposed in April 2021, to $2.9 per million British thermal units (mmBtu) from $1.79. Further it was raised to $6.1 per mmBtu in September 2021. The restricted supply of gas forced fertiliser firms, like other consumers, to go in for high-cost imported liquefied natural gas (LNG).

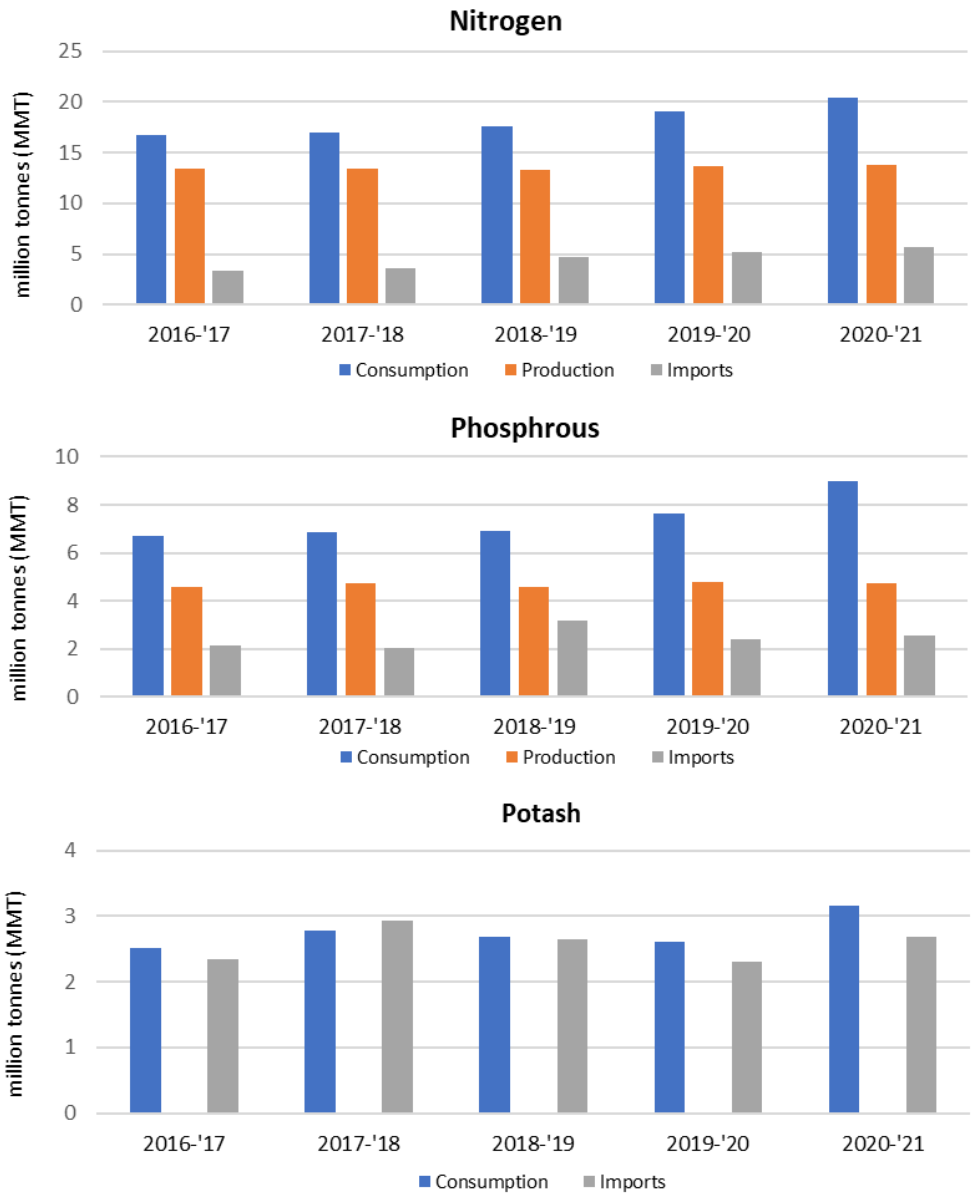
China’s ban on exports

China remains a major source of imported fertilisers for India with a share of 29% and 27% in imports of urea and DAP respectively in the financial year 2021. Both availability and prices were affected adversely following the suspension of fertiliser exports by the Chinese government in August 2021. Supplies were already restricted due to the pandemic and strong demand for nutrients from the US, Brazil, China, and India. China's action has resulted in international prices going up significantly since last year.

Impact of Ukraine war

The Ukraine war, which began in February 2022, has had a catastrophic effect on the above situation already fuelled by China’s suspension of fertiliser exports. India’s dependence on the import of fertiliser materials from Russia, Belarus, and Ukraine, as indicated above, are as significant as the Baltic trading of these products. The war has threatened the availability of materials and driven prices sky-high.

Production, imports, and consumption of major fertilisers
(2016-21, in million tonnes)



Way forward

In the present situation, the cost of mineral fertilisers is rapidly increasing and its availability is threatened by global supply disruptions. At the global level, several agencies forecast food insecurity. We need to ensure both the availability and affordability of fertilisers to farmers to sustain food grain production. Therefore, keeping the medium to long-term in mind, we may have to reorient our current practices in the application of plant nutrients through mineral and chemical fertilisers.

In this respect, the following measures may be considered.

Investment policies

In the wake of the Ukraine war, the much-criticised administered pricing system for urea prevailing since 1978 has saved farmers and the industry in the country. Even the partial decontrol of phosphate and potassic fertilisers shielded farmers from the huge price rise in international markets. In view of this, the central government should do away with its practice of privatising public sector undertakings in the fertiliser sector.

The government should also have a steadfast action plan to increase the domestic production of fertilisers. As ammonia, a major fertiliser input, is slated to become the fuel of the future for long-distance hauling, its production will serve the twin purposes of having more fertilisers and serving as a reserve fuel. The preferential allocation of natural gas to the fertiliser sector also has to be restored. Currently, the sector gets domestic gas after allocation for household consumption and for automobiles.

Pushing up output

Existing fertiliser plants may have the capability to produce beyond their stated capacities. Production beyond the assessed quantum was not encouraged earlier to avoid investors "gold plating" to claim more capital subsidies under the administered pricing mechanism (APM). In the renewed situation, all producers should be encouraged to produce whatever possible to tide over the exorbitant import prices that prevail now, especially in the wake of the Ukraine war.

Another step would be to speed up the commissioning of the urea plants under construction. Ramagundam Fertilisers and Chemicals and Hindustan Urvarak & Rasayan Ltd (HURL) Gorakhpur have started operations. HURL Baruni is expected to go on-stream by June this year, and the Talcher unit is set to become operative by end of 2024. India has to have a dedicated effort to fast-track the commissioning and operation of these projects.

More efficient use

More diligent use of available (indigenous and imported) urea and DAP is the need of the hour. The government has made certain efforts in the past to achieve a balanced and scientific application of mineral nutrients in our farms. Here, only partial success has been achieved. A more concerted action plan for effective soil testing and fertiliser administration is warranted to not only conserve costly fertilisers, and reduce its waste but also to ward off its leaching and consequential environmental problems.

Urban and city compost should be given a renewed thrust to meet part of our nutrient demand. More and more municipalities and corporations should be encouraged to mandatorily implement such projects. This will not only render cities and neighbourhoods clean but also provide low analysis fertilisers for horticulture and the like. We should also try blending urea and DAP with city composts so that better assimilation by plants is made easy. Indirectly, this will reduce the wastage of concentrated fertilisers. Having a nationwide programme to promote the use of agricultural wastes, green leaves, and farmland manure as readily available sources of nourishment for crops could also go a long way towards more efficiently using fertilisers.

Alternative sources

Promoting the effective utilisation of low-grade rock phosphate deposits available in the country (in Rajasthan, for instance) through advanced beneficiation techniques could be useful. Gypsum from salt pans contains several plant nutrients and is used as manure and also in cement plants. The use of this material as manure should be incentivised and cement plants could be directed to use phospho-gypsum or mined gypsum.

M.P. Sukumaran Nair is Director, Centre for Green Technology and Management, Kochi. He was chairman of Kerala's Public Sector Restructuring and Internal Audit Board and secretary to the chief minister of Kerala He has professional expertise spanning more than 40 years in the government and the chemical industry.

Footnotes:

1 The fertiliser complex of Matix Fertilisers and Chemicals Ltd is located at Panagarh near Durgapur, West Bengal. The plant, commissioned in September 2021, is producing urea. It is one of the world's largest single stream greenfield plants and the first with a feedstock supply of a combination of regasified liquefied natural gas (RLNG) and coal bed methane.

2 The developments in modern fertiliser administration practices include foliar fertilisation, mist irrigation, regenerative farming, precise nutrient delivery, use of specialty and customised fertilisers that contain one or more of the essential nutrients and are developed based on growers' need for a balanced supply of fertiliser nutrients to crop. It also includes use of front-running technologies in crop management involving aerial imaging, satellite imaging, drone technology for field mapping and yield prediction, and so on.