

Indian fertilizer policies: revisiting the odyssey and lessons from abroad

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Fertilizer campaign has played a crucial role in the journey of Indian agriculture. Well-directed policies that regulated the fertilizer sector, have contributed to improve the availability as well as consumption of fertilizers at the farm level. The scenario under which fertilizer policies need to operate changes rapidly, and this leads to new challenges. The odyssey of Indian fertilizer policy regime, stretching to more than 60 years, is complex but interesting. Here we trace this regime and the fertilizer policies of selected countries from which India can learn.

Keywords: Agriculture, fertilizer policy, nutrient balance, input subsidy.

FERTILIZER campaign has played a crucial role in Indian agriculture from being food-deficient to food-sufficient. Use of fertilizers in Indian agriculture progressed slowly during the first half of the 20th century. Fertilizer use was hindered by the low price of agricultural commodities that prevailed then. The first fertilizer plant in India started operating in the year 1906 at Ranipet in the erstwhile Madras Presidency. It had the capacity to produce 6000 MT of single super phosphate (SSP) per year. Later, ammonium sulphate was manufactured as a by-product of steel industry in 1933 at Jamshedpur and using sulphuric acid in 1941 at Belagula, Mysore¹. Almost 80% of the nutrient requirements during 1930s and 1940s were met from imports. Sugarcane and paddy were among the first crops that used chemical fertilizers.

Fixation of fertilizer prices on the basis of no-profit-no-loss in 1943 marked the dawn of fertilizer price control. The Government also took control of the fertilizer distribution by establishing the Central Fertilizer Pool in 1944. Under this scheme both domestic as well as imported fertilizers were pooled together and distributed through the state agencies and commodity boards. The Central Fertilizer Pool distributed fertilizers to the provinces without any profits. Certain provinces even subsidized the use of fertilizers. To avoid the concentration of fertilizers in the cash crops, decision was made to limit their use to a maximum of 25% in such crops. Rice among the food crops and sugarcane, tea and tobacco among cash crops received fertilizer application. Out of

the total rice cultivated, less than 1% received fertilizers then².

Pooling and distribution of fertilizers by the Central Fertilizer Pool, however, could not ensure the equity in distribution among regions. Prices of fertilizers varied by locations since the railway freight was not considered in setting the price. Decision was made to charge a uniform price by including the equated railway freight in the prices by the Government³. Post-independence the Government passed the Fertilizer Control Order (FCO) in 1957 under the Essential Commodities Act (ECA) of 1955, targeted to regulate the sale, price and quality of the fertilizers.

Fertilizer policy: the odyssey

Drift to growth

In 1966, the manufacturers were allowed to market a maximum of 50% of their production (the other 50% by the Government), thus initiating the multi-channel approach in fertilizer marketing. For a brief period, in 1969, the domestic manufacturers were also given complete freedom in the marketing of fertilizers, thereby terminating the pooling of fertilizers. During the early 1970s, fertilizer consumption failed to grow due to the decreased imports and poor growth in domestic production which led to unavailability of fertilizers to the farmers. The Government was thus forced to withdraw the complete freedom in marketing and regulate the fertilizer distribution with the ECA.

Policies determined to better fertilizer distribution were implemented in the next decade as the country felt the shortage of fertilizers when it geared up for the Green Revolution. The distribution as well as the inter-state movement of fertilizers was brought under the Government control in 1973 through the Fertilizers Movement Control Order. This initiative of the Government did help in channelling fertilizers to the potential Green Revolution areas.

Between the period 1966 and 1974, prices of fertilizers increased almost 60% (Figure 1). This was mainly due to two reasons, viz. devaluation of the rupee in 1966 and the oil price shock in 1973. The latter resulted in a significant increase in the prices of imported fertilizers. The cost of

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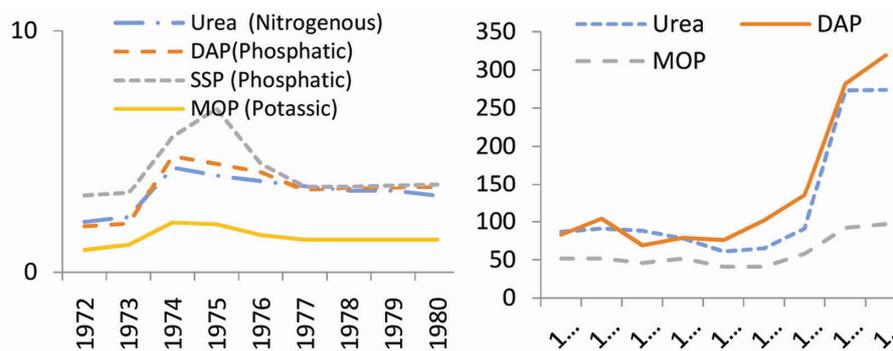


Figure 1. Retail (Rs/kg of nutrient) and average cost and freight (CFR) (India) prices (US\$/tonne). Source: Fertiliser Association of India¹.

Table 1. Number of fertilizer sale points from 1975 to 1985 – all-India

Year	Cooperative and other institutional agencies	Per cent share to total	Private	Per cent share to total	Total number of sale points
1975	39,156	40	59,473	60	98,629
1976	39,950	42	54,673	58	94,623
1977	33,404	40	49,916	60	83,320
1978	43,264	42	58,575	58	101,839
1979	46,224	40	69,293	60	115,517
1980	51,560	44	64,862	56	116,422
1981	41,837	38	68,127	62	109,964
1982	43,127	37	71,943	63	115,070
1983	50,243	38	80,590	62	130,833
1984	55,279	38	90,538	62	145,817
1985	59,658	38	96,080	62	155,738

Source: Fertiliser Association of India¹.

indigenous fertilizer production also rose markedly owing to the sudden escalation in prices of raw materials. Fertilizer Pool Equalization Charge (FPEC) was introduced in 1974 and a fixed subsidy programme (Rs 1250/tonne of P_2O_5) in 1976 to prevent any gain to the Indian manufacturers due to these changes, and also to reduce the burden of subsidy on imported fertilizers. Under FPEC the cost of imported fertilizers was subsidized with the contribution of indigenous manufacturers (Rs 610/tonne of urea) to this pool.

Rapid advancement

The production and import costs for fertilizers escalated in the early seventies due to the oil price shock. As a result, the fertilizers were becoming unaffordable to Indian farmers. With the investments going down, the expansion of production capacity also faced a setback. In May 1977, in order to keep the farm gate prices low under the scenario of rising manufacture/import cost, the S. S. Marathe recommended to implement the Retention Price Scheme (RPS). According to RPS each production unit, regardless of age, location, technology and cost of

production, will now receive a 12% post tax return on net worth. A retention price for each unit was fixed based on the cost of production.

A scheme for the better transportation of fertilizers from the production plants to the consumption centres was brought out through the Equated Freight Scheme implemented in 1979. It was meant to cover the cost of transportation from the plants to the block headquarters of the states/Union Territories. Equated freight rates for the fertilizer manufacturers were fixed considering the mode of transport and distance. It was calculated on monthly basis and paid to the manufacturers. In addition to the production subsidies through RPS, equated freight subsidy was paid to the manufacturers. To open more fertilizer retails at remote and inaccessible areas and promote the use of fertilizers there, Block Delivery Scheme was adopted in 1980. This scheme provided the cost of secondary freight from the railheads to the interiors.

The policy measures from the part of the Government which started during the mid-seventies resulted in the opening of more fertilizer outlets all over the country (Table 1). Sale points were opened even in remote areas. Both the cooperative and other institutional agencies as well as private players contributed to this development.

The total number of sale points which was 83,320 in 1977 increased to 101,839 in 1978. Though the private sale points were more in number, the per cent contribution of both private and public sale points to the total remained almost stagnant. Similarly, consumption of fertilizers also started increasing significantly from 1978 (Figure 2). The consumption which was 4285.8 thousand tonnes in 1977–78 escalated to 5116.9 thousand tonnes in 1978–79. Nitrogenous fertilizers were the major contributors to this. With the increased consumption and production, the subsidy burden of the Government also increased. This was mainly due to low farm gate price, high input cost, high output and high capital cost of production. The whole policy developments which were originally thought to be self-financing ended up in higher subsidies.

Amelioration begins

Bringing down the fertilizer subsidy burden was a part of the new economic policy implemented in India since 1991. To meet this end, the prices of ammonium sulphate, calcium ammonium nitrate and ammonium chloride were decontrolled with effect from 25 July 1991. The Government also raised the fertilizer prices to 40% in the same month. The Indian farmers protested and rioted to revoke this decision. In some states, the farmers looted the warehouses and trucks containing fertilizers and demonstrating in front of Government offices.

In August 1991, the Government experimented with a dual pricing scheme wherein the small and marginal farmers (holding up to 2 ha) were exempted from the hiked fertilizer price. However, this scheme was short-lived and terminated the very next year of its implementation. The prices, movement and distribution of all the phosphatic and potassic fertilizers were decontrolled in August 1992. This resulted in an increase in the price of both types of fertilizers (Table 2). In per cent terms the increase in price was more for K_2O (165%). The price of P_2O_5 increased by 64% and 125% through diammonium phosphate (DAP) and single super phosphate (SSP) respectively. There was not much change in the world prices during the period considered.

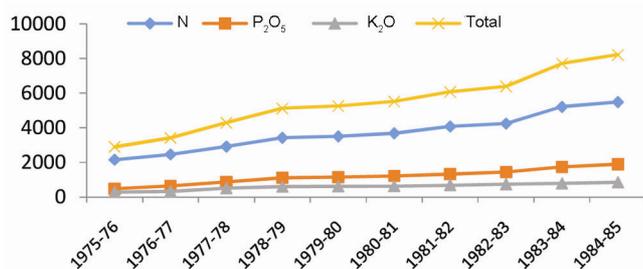


Figure 2. All-India consumption of fertilizers ('000 tonnes) from 1975–76 to 1984–85. Source: Fertiliser Association of India¹.

After years of studies by various committees, a policy called New Pricing Scheme (NPS) was implemented for urea units from April 2003 onwards. This was meant to improve the efficiency, transparency and uniformity in disbursements of subsidies to each urea unit and, in a greater sense, to induce each unit to implement cost reduction measures themselves and be competitive. The scheme implemented in three phases replaced the then existing RPS by a group-based concession approach. It also envisaged phased decontrol of movement, distribution and sale of urea.

According to the NPS, the ECA allocations will cover 75% of the total dispatches of manufacturers and the remaining 25% can be sold anywhere in India in the *kharif* 2003 season. This was changed to 50 : 50 for *rabi* 2003–04. After stage I (1 April 2003 to 31 March 2004) and stage II (1 April 2004 to 31 March 2006), a working group on the review of stages I and II of NPS and formulation of policy for stage III for urea units was set-up. On the recommendations of the working group under the chairmanship of Y. K. Alagh in 2005, the Government notified the NPS stage III on 8 March 2006. The stage III policy seeks to promote further investment in the urea sector and to maximize urea production. It also seeks to rationalize the movement and distribution of urea and the system of freight reimbursement with the objective of ensuring availability of urea all over the country.

Emphasizing on nutrient balance

A task force on balanced use of fertilizers was then constituted under the leadership of A. K. Singh. It submitted its report in 2005–06 which recommended the restoration of N : P : K use ratio at macro level by increasing the consumption of P and K. The committee also felt the need for recognition of sulphur as a critical input at par with NPK for price fixation and subsidy, and the extension of subsidy to other secondary and micro nutrients. Guidelines for production and use of customized fertilizers were released in 2008 to enable the interested companies to manufacture and sell customized fertilizers. To improve the fertilizer use efficiency as well as the use of secondary and micro nutrients, fortification of 20% of the total fertilizer produced was allowed in the same year. The added costs of fortification were allowed to be charged through the retail price.

Nutrient-based pricing was implemented by the government w.e.f. 18 June 2008, under which the per unit price of the nutrients was same in all the fertilizers. Till then, the prices of nutrients in complex grade fertilizers were higher than those of the same nutrients in the straight fertilizers; this resulted in higher consumption of straight fertilizers compared to complex fertilizers. The price of the complex fertilizers was reduced markedly after the implementation of nutrient-based pricing (Table 3).

Table 2. Retail price (Rs/kg nutrients) of fertilizers in terms of nutrients

Year/effective date	Urea (nitrogenous)	DAP (phosphatic)	SSP (phosphatic)	MOP (potassic)
11 July 1981	5.11	5.83	5.74	2.17
29 June 1983	4.67	5.46	5.31	2.00
31 January 1986	5.11	5.83	5.94	2.17
25 July 1991	7.17	8.15	8.38	3.03
14 August 1991	6.65	7.57	7.75	2.83
25 August 1992	6.00	12.43	17.5	7.50
1993–94	6.00	12.87	17.25	6.67

Source: Fertiliser Association of India¹.

Table 3. Effect of nutrient-based pricing on the cost (Rs/tonne) of the fertilizers

Fertilizer	Grade	Price prior to 18 June 2008	Price w.e.f. 18 June 2008	Change (%)
Complex fertilizers	16 : 20 : 0 : 13	7100	5875	-17.25
	20 : 20 : 0 : 13	7280	6295	-13.53
	28 : 28 : 0 : 0	9080	7481	-17.61
	14 : 35 : 14 : 0	8660	8185	-5.48
	15 : 15 : 15 : 0	6980	5121	-26.63
	20 : 20 : 0 : 0	7280	5343	-26.61
	23 : 23 : 0 : 0	8000	6145	-23.19
	17 : 17 : 17 : 0	8100	5804	-28.35
	19 : 19 : 19 : 0	8300	6487	-21.84
	10 : 26 : 26 : 0	8360	7197	-13.91
	12 : 32 : 16 : 0	8480	7637	-9.94
	14 : 28 : 14 : 0	8300	7050	-15.06
	Straight fertilizers	Urea	4830	4830
DAP		9350	9350	0.00
MOP		4455	4455	0.00
SSP		3400	3400	0.00

Source: Fertiliser Association of India¹.

The decrease in price was as much as 26–28% in some of the complex fertilizers. At the same time, the price of all the straight fertilizers remained at the same level even after the implementation of the scheme.

The Government approved and implemented the policy for new investments in the urea sector, both indigenous and abroad in two steps – first in 2008 and then in 2012. Joint venture (JV) projects abroad were the next big policy, that were also encouraged through firm off take contracts. Pricing in such contracts was decided on the basis of prevailing market conditions and in mutual consultation with JV partners (Table 4).

The efforts to ensure balanced application of fertilizers continued with the movement towards a Nutrient Based Subsidy (NBS) regime. The first phase of the NBS policy for P and K fertilizers was implemented on 1 April 2010. The revision of the NBS to be paid for each nutrient will be done annually by the Government (Table 5). The NBS so decided by the Government will be converted into subsidy per tonne of the subsidized fertilizers. Also, per metric tonne (MT) additional subsidy for fortified fertilizers with boron was fixed at Rs 300/tonne, and zinc at Rs 500/tonne. Manufacturers of customized fertilizers and mixture fertilizers were made eligible to source subsidi-

dized fertilizers from the manufacturers/importers. The market price of subsidized fertilizers, except urea will be now determined based on demand/supply balance.

The decision of the Government to make it mandatory for the domestic urea manufacturers to produce at least 75% of urea as neem-coated is considered as an important step. The manufacturers are even granted permission to produce their entire urea as neem-coated. This policy is intended mainly to reduce urea usage per plot since neem-coated urea improves the nitrogen use efficiency of crops, reduce nitrogen leaching and check the diversion of urea towards industrial uses.

Incidence of fertilizer policies overseas

Brazil

Brazil is traditionally a net importer of fertilizers. The fertilizer industry in Brazil is heavily dependent on the imports of raw materials and intermediate products. The price volatility in the international market compelled the Brazilian Government to introduce a state-owned company (in 2008–09) to regulate the domestic fertilizer

Table 4. Commissioned joint ventures abroad

Company	Location	Participants	Date of commissioning	Product
ICS, Senegal	Darou, Senegal	IFFCO India, GOI, ICS Senegal	April 1984	Phosphoric acid
ICS, Senegal (Expansion)	Darou, Senegal	IFFCO India, ICS Senegal	February 2002	Phosphoric acid
Indo Jordan Chemicals Co	Eshidiya, Jordan	JPMC, Jordan; the Arab Investment Co	May 1997	Phosphoric acid
Indo Maroc Phosphore SA (IMACID)	Jorf Lasfer, Morocco	CFCL India, TCL India, OCP-Morocco	October 1999	Phosphoric acid
Oman India Fertiliser Co. (OMIFCO)	Sur, Muscat, Oman	KRIBHCO India, IFFCO India, Oil Co, Oman	July 2005	Urea (granulated) Ammonia

Source: Fertiliser Association of India¹. ICS, Industries Chimiques du Senegal.

Table 5. Nutrient based subsidy for N, P, K and S (Rs/kg)

Year	N	P	K	S
2010–11	23.227	26.276	24.487	1.784
2011–12	27.153	32.338	26.756	1.677
2012–13	24.000	21.8.000	24.000	1.670
2013–14	20.875	18.679	18.333	1.677
2014–15	20.875	18.679	15.500	1.677

Source: Fertiliser Association of India¹.

market and increase the availability of raw materials. The state-owned company has two major functions. (i) to explore mineral fields and source major minerals, and (ii) to act as a price buffering mechanism between international and domestic markets. It has to subsidize domestic prices when international prices are high and earn profits when the situation is reverse. The National Plan for Fertilizer Sector (2009) proposes the Government to invest in the identification of mineral deposits. The exploration, however, is left to the private sector. Both these policies are still under consideration⁴.

In 1966, the Brazilian Government had implemented a credit policy to increase fertilizer use by the farmers. This policy was implemented through a programme called FUNFERTIL⁵. Credit was made available for fertilizer purchases at zero nominal interest. The policy provided fertilizers to the farmers when required and allowed them to pay back after marketing the products. The concerns of the Government on the overdependence on imports resulted in the implementation of a policy (in 1960s) which promoted domestic production. A decrease in the percentage of participation of imports in total consumption was made possible by the increase in domestic production⁶.

Russia

Russian fertilizer industry is one of the largest in the world. The fertilizer consumption which declined drastically during the 1990s was the major concern of the Russian policy makers. To revert to the trend of higher fertilizer consumption, a policy that ensures subsidy for domestic fertilizer sales was put in place in 1999. The

policy provided 40% subsidy for home agricultural use till June 2000, after which it was reduced to 25%. Policies that provide privileged rail tariff for delivering fertilizers to agriculture and raw materials to producers were also implemented. In 1999, the Government introduced a policy by which the inputs for fertilizer manufacture were available at lesser cost for the domestic firms. Through this policy, the firms received a 50% reduction in the official price of natural gas and electricity for the production of fertilizer for the domestic market⁷.

Other fertilizer policies in Russia include: fertilizer quotas for agricultural producers (2008–12), fixation of fertilizer price by the Government (2008–12), long-term planning of fertilizer mix in regions consuming fertilizers, credit facilities for agricultural producers (2012) and subsidy assistance to the agricultural producers to the extent of 30% of the price of the fertilizers⁸.

China

The fertilizer policies in China evolved through several stages of support, planned management and adjustment. China's fertilizer industry has been enjoying preferential policies in raw materials, transportation, taxes, water, electricity, gas and other aspects for several years⁹. Since 2006, the state began to abolish these preferential policies owing to the commitments under the World Trade Organization (WTO) and the macroscopic regulation by the state. Even though the policies are drifting towards market adjustments, the preferential policies are not fully abolished yet.

All links in the production of fertilizers are exempt from tax. Preferential VAT includes tax exemption for production and tax reimbursement for imports. After joining the WTO in December 2001, China implemented the tariff quota administration with regard to import of fertilizers. Customs tariff for fertilizer imported within the tariff quota is much lower than that for fertilizer imported outside the tariff quota. Pricing and subsidy policies are also being used as an instrument for regulating the use of fertilizers in China¹⁰.

A policy was implemented in 2004 to ensure the supply of fertilizers throughout the year. According to this policy,

off-season reserves of fertilizers were maintained at the central authority and local authority levels. The storage volume of the off-season stockpiling programme increased from 6.5 million tonnes in 2004 to 16.0 million tonnes in 2011. The participants in this programme also enjoy subsidized loans. Apart from this, preferential treatment has also been given to rail transport freight of fertilizer enterprises.

Thailand

The fertilizer requirements of Thailand are met mainly by the imports, as it does not have any fertilizer production plant. There are several plants which blend mixtures of various grades using imported straight and compound fertilizers as raw materials. The price fluctuations in the international market significantly affect the domestic fertilizer prices due to this high level of dependence on imports. To combat this issue, the Government has implemented price policies¹¹.

Fertilizer prices paid by Thai farmers vary depending on the source of supply and terms under which the fertilizers are purchased. The Government supplied subsidized fertilizers through the Marketing Organization for Farmers (MOF). It was the cheapest source of fertilizers then. The Bank of Agriculture and Agricultural Co-operatives (BAAC) also supplied fertilizers, but at a slightly higher price than the MOF price. Both these organizations, along with about 30 domestic and foreign banks, also provide credit for fertilizers at low rates of interest. Tax exemption for fertilizer imports and popularizing the use of organic fertilizers are the other major policies being implemented in Thailand¹².

The Philippines

The fertilizer industry in the Philippines followed a policy of laissez faire till 1972. The Government intervention started in 1973, when it created the Fertilizer Industry Authority (FIA). The jurisdiction of FIA included control over prices, distribution, import, export and production. FIA was also given tax exemption for imports of all kinds of fertilizers. The Fertilizer and Pesticide Authority (FPA) replaced the FIA in 1977, and it is currently the authority for implementation of fertilizer policies.

As a part of the liberalization policy of the Government, fertilizer trade was deregulated in 1986. Even though subsidies had contributed significantly to the increase in fertilizer consumption and higher agricultural yield, it was put on hold from 1998. A policy which provided import duty incentives was implemented in 1997. This allowed duty exemption for fertilizer shipments. From 1999, fertilizer imports by cooperatives, farmers' associations and other entities directly involved in agri-

culture were given complete exemption from VAT¹³. The fertilizer requirements of the Philippines are met from domestic production, imports as well as fertilizer grants from countries like Japan. Policy to popularize the use of organic fertilizers has also been implemented¹⁴.

Fertilizer policies: lessons from abroad

Policies regulating pricing and subsidy

The Government of India (GoI) has adopted various policy measures to ensure the supply of fertilizers at affordable rates throughout the country. One such policy measure is the subsidies given to the fertilizer manufacturers. According to the existing subsidy policy, all farmers, irrespective of their income and holdings, are eligible for subsidized fertilizers. Fertilizer manufacturers are entitled to receive the difference between the normative cost of production and the maximum retail price (MRP) at which fertilizers are sold. There is no restriction according to their efficiency or capacity utilization. In other words, the subsidy policy regime in India has failed to help the fertilizer manufacturers achieve efficiency. The manufacturers, since they continue to receive subsidies, are not worried about the inefficiencies creeping in.

Subsidy intervention from the input side will be needed in future, as the availability of feedstocks and raw materials is the major constraint faced by the industry. Fertilizer manufacturers will then be bound to improve the efficiency of their plants when subsidies to procure raw materials and feedstock are given to them. The increased efficiency will lead to higher production, then to higher availability and ultimately to price reduction of the final fertilizer produce. The evidences from other countries also prove that fertilizer subsidies are more effective when given to inputs required to manufacture them. China is one country which subsidizes the inputs or raw materials required for fertilizer manufacture. In China, preferential treatment is given to natural gas used in nitrogenous fertilizer plants. The cost of natural gas within the Government plan, used in nitrogenous fertilizer enterprises, is lower than those outside the plan. The Chinese Government also provides preferential price for coal, which is another raw material in fertilizer production. Due to this preferential policy to natural gas, the fertilizer plants are rapidly getting converted into the best ones which use natural gas as feedstock.

Policies fostering fertilizer marketing and distribution

The marketing and distribution system for fertilizers in India has evolved over the years through several policy measures. These policies, well-thoughtout and

implemented, by the GoI has made it comparable to the world standards. The fertilizer market in India is large, but difficult to tap. The major portion of the fertilizer market is situated in rural India, where the farmers are sceptical about any new product or technology. The marketing and distribution policies are thus relevant since these decide on the availability and purchase of fertilizers. These policies also affect the equity of the fertilizer use by region and farmer categories.

The number of private retailers is high in India and fare competition exists at their level. The three-tier and two-tier cooperative networks also work effectively to distribute the fertilizers. Provision, however, is not available to provide fertilizers, in customized packs, sufficient for specific size of holding. A policy which makes the fertilizers available in smaller quantity along with other inputs like high-yielding seeds and plant protection chemicals may help the small and marginal farmers in India.

There exist some policy interventions in other countries, which potentially have implications for fertilizer distribution in India. The starter programme in Malawi, which was operational till 2005, is one such example. Through this programme, the Malawian Government provided high-yielding seeds and free fertilizer adequate for 0.1 ha of land to help small farmers. During the seasons in which high-yielding maize seeds were distributed along with fertilizers as starter pack, the production of maize increased considerably. The policy made significant contribution to food security by affecting the access and price of output¹⁵.

In rural areas of India where delivery costs are high, combining different inputs along the lines in the starter programme could be beneficial. Hence, cost savings could be achieved by combining fertilizers with seeds or any other input. Yet, the fiscal stress that ultimately led to withdrawal of the starter programme has a lesson to offer as well. The dynamic path of cost of the programme needs to be carefully evaluated from its inception itself.

Policies for deciding on production and imports

The consumption of fertilizers in India has shown a steady increase over the years. It was 69.8 thousand tonnes in 1950–51 and 27,790 thousand tonnes in 2011–12. The demand for fertilizers in India is projected to a level of 39,603 thousand tonnes by 2024–25 by the Planning Commission. In this context, the decision to produce or import has utmost relevance. Primarily because there exist limitations in the availability of raw materials and feedstocks required for increase in production, and secondly, because the imports depend heavily on the evolving international trade regulations. The options to meet the increasing demand, however, are limited to those of creating new capacities, capacity expansion,

modernization of existing units, changeover to more efficient feedstocks, JVs and long-term offtake arrangements with foreign countries.

The option of self-sufficiency in fertilizers may not benefit India owing to difficulties in the availability of raw materials. The country must depend on JVs and long-term offtake arrangement for fertilizers and raw materials. Policies to ensure uninterrupted and steady supply of finished fertilizers and raw materials are the need of the hour. To meet this end, India can probably learn from the fertilizer strategy of Thailand, which does not have any fertilizer producing plant. There are several mixing plants which blend mixtures of various grades using imported straight or compound fertilizer as raw materials. Thailand successfully imports all of its fertilizer requirements. Also, there is no tax on the import of fertilizers.

Policies imposing tax on fertilizers and raw materials

The fiscal policies related to the sales of fertilizers and inputs used in the manufacture of fertilizers are essential for the well-being of the fertilizer industry. The farmers in India, spread across different states, have to pay contrasting prices for the same fertilizers. The reason for this is the difference in sales tax and other taxes levied by the states on the sale of fertilizers. Several kinds of taxes and duties are levied even on the raw materials imported by the fertilizer manufacturers. Some of them are sales tax, VAT and excise duty. States also impose entry tax on inputs. Further, the Goods and Services Tax (GST) is again going to affect the fertilizer industry in a big way. Higher GST rate in comparison to the existing excise duty is a concern and this needs to be studied further.

In India, the MRP of fertilizers is determined by the Government. This policy prohibits the passing of taxes and duties paid by the manufacturers to the consumers as higher retail prices. The manufacturers are, however, eligible for reimbursement of these taxes and duties through the concession scheme. The drawback in this scheme is that the manufacturers may encounter direct loss if the taxes and duties are not recognized, or if they are restricted to some level.

In China, the Government has implemented a policy of VAT holiday for NPK compound fertilizers, monoammonium phosphate, urea and diammonium phosphate. In addition, they provide VAT refund for exported fertilizers. The raw materials imported in China for fertilizer manufacturing also enjoy VAT holiday, low tariffs and low import custom tax. This policy, if implemented in India, can better the health of the fertilizer manufacturers. The manufacturers, who are currently facing problems of high cost and non-availability of raw materials, will get some relief through VAT holiday on imported raw materials.

Policies for better technology

The development of the fertilizer industry is crucial for achieving the broader objective of food security in India. The fertilizer industry has shown a robust growth ever since the first manufacturing unit of SSP was set-up in 1906 at Ranipet. Significant addition to the production capacity took place later in the 1960s during the Green Revolution era. The favourable policy environment created by the Government helped the industry overcome the obstacles in its path. Indian fertilizer industry is comparable to the world standards in terms of technology. The industry has tried to incorporate the technological developments from around the world. The efficiency, capacity utilization and energy consumption of the industry are comparable to the world standards.

In future the industry will have to face challenges from various fronts. It has to promote sustainable development by investing in technologies that are water, energy and feedstock efficient to meet the expectations of the country. The future technologies of the industry should be safe for the environment. They should maintain a balance between economic needs and financial constraints along with impacting growth. To meet these challenges, the policy makers in India can learn from the experiences of the Chinese fertilizer industry.

The fertilizer industry in China imported large installations, which use different raw materials, from foreign countries. This expedited their technological advancement and minimized the gap with advanced technologies in the world. Funds from foreign countries contributed significantly in this process. The Chinese learned lessons from the management expertise of the better fertilizer industries and implemented them with suitable modifications. The skills of the workers were improved so that they could successfully deal with the imported machineries. The production unit for the large plants was imported and that of the small and medium scale was locally made. The Chinese strategy was thus to simultaneously depend on both domestic as well as foreign technologies and raw materials. This gave them insulation to the fluctuations in availability or price of the raw materials.

Policies for improving soil nutrient balance

In India, fertilizer consumption has shown a steady growth over the years. At present, India is the second largest fertilizer consumer in the world. In the 1960s and 1970s when self-sufficiency was the target of the policy makers, stress was given to increase the total consumption of fertilizers. Now, since India is among the top producers of food in the world, nutrient balance should be given more weight than total fertilizer consumption.

High variability in the ratio of consumption of these fertilizers exists at the regional level (Table 6) and the

state level. For obtaining higher yield, balance of all the nutrients (or balance in the ratio of N:P:K) should be ensured along with adequate application of secondary nutrients and micronutrients. Figure 3 shows the all-India consumption of plant nutrients per unit of gross cropped area. This undue advantage for N over P and K may be because the results of application of N are quickly visible in the crops. The Government policies which contained the prices of urea at a lower level, even when the prices of P and K fertilizers were decontrolled, must also have contributed to this.

The dynamic nutrient balance in the soil could be managed at levels favourable for practising agriculture, only if the specific needs of soils in different regions are understood. For this the soil should be tested and a mix of fertilizers according to the requirement of the soil, crop grown and irrigation available needs to be applied. Facilities for soil testing are available in India which, sadly, have not made any contributions to improve the nutrient balance.

Russia is one country that has taken the lead to ensure nutrient balance in the soil. Its policy makers have decided to undertake long-term planning of fertilizer mix for regions consuming fertilizers. India can definitely follow this policy of conceptualizing and using separate fertilizer mixes for various states and regions according to the requirements of the soil. The network of soil-testing laboratories has to be strengthened and the use of organic, customized and bio-fertilizers should be promoted.

Table 6. Region-wise consumption ratios of N and P₂O₅ in relation to K₂O (2013–14)

Region	Kharif		
	N	P ₂ O ₅	K ₂ O
East	4.3	1.3	1
North	32.4	7.9	1
South	4.8	1.8	1
West	8.4	3.5	1
All-India	8.0	2.7	1

Source: Fertiliser Association of India¹.

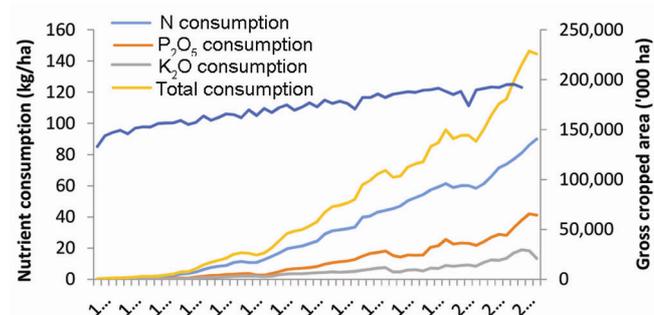


Figure 3. All-India consumption of plant nutrients (kg/ha) per unit of gross cropped area. Source: Fertiliser Association of India¹.

The chances for success of the policy to produce customized fertilizer mix, if implemented in India, will be high, as its fertilizer requirements are much higher than those of Russia. Large volumes of fertilizer mixes can then be produced, leading to better economies. Revamping of soil testing laboratories should also be done, so that the nutrient requirements of the soils can be traced correctly.

Summary

Several policies exist in India that regulate manufacture, import, marketing and availability of fertilizers; however, the future policy challenges are expected to be different. The country can, perhaps, learn from relevant policies existing in other countries. For this, major fertilizer policies that were successful in Brazil, Russia, China, Thailand and the Philippines have been explored in this study. India can learn from the policies implemented in these countries, viz. subsidize the inputs needed in fertilizer manufacture, sell customized fertilizers in smaller packs, better the import of fertilizers and raw materials, evade multiple taxes, and maintain soil nutrient balance.

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