

AN OVERVIEW OF FERTILIZER INDUSTRY IN ABROAD AS WELL AS IN INDIA

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Abstract : Accurate forecasting of fertilizer demand is essential, both for companies producing, importing and marketing fertilizer and for governments in their efforts to monitor the development of agriculture. Effective demand forecasting can enable importers to take full advantage of world market price fluctuations. Required storage, transport, staffing, credit, financial and foreign exchange arrangements are dependent on demand.

IndexTerms – fertilizer, demand forecasting, price fluctuations.

INTRODUCTION

Accurate forecasting of fertilizer demand is essential, both for companies producing, importing and marketing fertilizer and for governments in their efforts to monitor the development of agriculture. Because fertilizer demand depends on a variety of agro-economic factors, it is not stable nor it is amenable to accurate prediction. The choice of forecasting methodologies is thus particularly important, both for successful operation of fertilizer companies and for the formulation of appropriate policies by governments. To arrange timely supplies of the right fertilizer types in thousands of villages, it is necessary to have an assessment of the likely demand for each fertilizer type at numerous locations at different times in both the short and medium terms. Effective demand forecasting can enable importers to take full advantage of world market price fluctuations. Required storage, transport, staffing, credit, financial and foreign exchange arrangements are dependent on demand. If actual fertilizer demand is less than the fertilizer produced in or imported into a country, heavy financing costs and product losses will be the result.

USE PATTERN OF FERTILIZER PRODUCTS IN THE WORLD

Nitrogen

Urea is the most popular fertilizer in the developing countries. It accounts for 60.5% of nitrogen consumption in China and 82.1% of nitrogen consumption in India. Its popularity is due to various positive qualities of urea e.g. the nutrient content in urea is higher than any other competing products available resulting in lowest cost of transportation per unit of nutrient. Its critical humidity is high compared to the ammonium nitrate and calcium ammonium nitrate. It can be easily stored and handled under the hot and humid conditions in India without any significant deterioration in quality. On the other hand the critical humidity of ammonium nitrate is very low requiring storage in controlled atmospheric condition. It is also an explosive being hazardous in storage, handling and application.

In developed countries, liquid fertilizers (nitrogen solutions) have significant contribution in consumption of nitrogen. For example, the solutions account for 26.8% nitrogen in France and 25% nitrogen consumption in USA. There is a significant use of ammonia in direct application in Canada (27.9% of nitrogen) and in USA (26.3% of nitrogen). However, the Indian conditions with respect to climate, infrastructure, land holdings, etc. do not allow the direct application of ammonia. The application of nitrogen through compound fertilizers in India is similar to that prevailing in France, Germany, Canada and USA. The consumption pattern of various products in the world shows that India should diversify into other fertilizers including liquid fertilizers.

phosphate

In India, DAP is the major product contributing 62.7% of the total phosphate consumption. The other products are NP, NPK and SSP. China and Australia use SSP to meet 37.1% and Australia 24.5% of their respective requirement of phosphates compared to 9.9% share of SSP in India.

TABLE 1
WORLD FERTILIZER SUPPLY AND DEMAND, 2007/08-2011/12
(Thousand Tons)

Year	2007-08	2008-09	2009-10	2010-11	2011-12

Total Supply	2,06,431	2,12,225	2,19,930	2,30,334	2,40,711
Total demand	1,97,004	2,01,482	2,05,987	2,11,230	2,16,019
Surplus (Deficit)	9,427	10,743	13,943	19,104	24,692

(Difference between supply and consumption: Negative sign denotes deficit situation)

TABLE 2
WORLD NITROGEN SUPPLY AND DEMAND, 2007/08-2011/12
(Thousand Tons)

Year	2007-08	2008-09	2009-10	2010-11	2011-12
Total Supply	1,31,106	1,36,252	1,40,732	1,47,748	1,54,198
Total demand	1,27,820	1,30,409	1,33,059	1,36,198	1,39,140
Surplus (Deficit)	3,286	5,843	7,673	11,550	15,058

(Difference between supply and consumption: Negative sign denotes deficit situation)

TABLE 3
WORLD PHOSPHATE SUPPLY AND DEMAND, 2007/08-2011/12
(Thousand Tons)

Year	2007-08	2008-09	2009-10	2010-11	2011-12
Total Supply	4,37,000	38,461	39,672	41,112	43,299
Total demand	4,36,613	37,554	38,456	39,528	40,426
Surplus (Deficit)	387	907	1,216	1,584	2,873

(Difference between supply and consumption: Negative sign denotes deficit situation)

WORLD FERTILIZER MARKET

Fertilizer demand has historically been influenced by changing and often interrelated factors such as population and economic growth, agricultural production, prices and government policies. This still holds. However, three developments distinguish the current state of agricultural markets from past fluctuations, namely that the hike in world prices concerns nearly all major food and feed commodities, that record prices are being achieved at a time not of scarcity but of abundance, and that linkages between agricultural commodity markets and other markets are strengthening. Such phenomena already manifest in 2006 strengthened in 2007 a year characterised by persistent market uncertainty, record prices and unprecedented volatility in grain markets. The magnitude and nature of these changes have led some observers to refer to a paradigm shift in agriculture away from decreasing real food prices over the past thirty years. Given the inextricable link between food production and fertilizer use, it is opportune to consider such changes when reviewing prospects for fertilizer demand and supply balances until 2011/12.

GROWTH OF INDIAN FERTILIZER INDUSTRY

The Indian fertilizer industry has come a long way since the setting up of the manufacturing unit of Single Super phosphate (SSP) near Chennai in 1906. A new impetus to the growth of Indian Fertilizer

industry was provided by the set up the two fertilizer plants- Fertilizer and Chemicals Travancore of India Limited (FACT) in Kerala and the Fertilizers Corporation of India (FCI) in Bihar. This was during the forties and the fifties. The aim was to create an industrial base that would provide India with self reliability in food grains.

India witnessed significant growth of the fertilizer industry during the sixties and the seventies. By 2003, India had an installed capacity of 12.11 million MT of nitrogen and 5.36 million MT of phosphate. Today, with 57 large sized fertilizer plants manufacturing a wide variety of the nitrogenous, complex and phosphatic fertilizers, the Indian fertilizer industry is the 3rd largest producer in the world. One of the major factors that have led to the rapid increase in the production capacity of fertilizers in India is the policy environment. With the formulation and implementation of investor friendly policies, large investments poured into the private, public and co-operative sectors and this propelled the growth of the Indian fertilizer industry.

Reports showed the total installed capacity of fertilizer production in 2004 to be 119.60 LMT of nitrogen and 53.60 LMT of phosphate. These figures went up to 120.61 LMT of nitrogen and 56.59 LMT of phosphate in 2007. The production of fertilizers was 113.54 LMT of nitrogen and 42.21 LMT of phosphate during 2005-06. The target of production for 2006-07 was set at 114.48 LMT of nitrogen and 48.20 LMT of phosphate. Though the target production was not met, there was a growth in production during 2006-07 as compared to the production during 2005-06. Indian fertilizer industry has reached international levels of capacity utilization by adopting various strategies for increasing the productions of fertilizers.

CHALLENGES BEFORE INDIAN FERTILIZER INDUSTRY

The growth trajectory of the Indian fertilizer industry has camouflaged the impending challenges with which it is faced. Growth and development of agriculture in India derives a significant stimulus from the fertilizer industry. Agricultural milieu in India could be jeopardized by the uncertainties in the fertilizer industry. The government is faced with the piquant situation, which demands a balance between the needs of the farmers and the fertilizer manufacturers.

The challenges before the Indian fertilizer industry relate to the incertitude in the supply of fertilizers. There has been a surge in the demand for fertilizers in the past few years. Good monsoonal showers have led to the growth in agriculture, inadvertently increasing the consumption rate of fertilizers. However, the robust growth in consumption propensity has not been met with the required surge in fertilizer production. This has widened the gap between the demand and supply of fertilizers, which has led to an increase in the dependence of the country on imports. This also reflects on the lack of realizing of the domestic capacity utilization of the reserves in the country.

Another important factor that has led to the stunted growth of the fertilizer industry is the rise in prices of the feedstock. The fertilizer industry is dependent on gas for the production of urea and phosphoric acid for the production of phosphoric fertilizers and DAP. The country imports its inputs from other countries. The overseas suppliers of raw materials realize the predicament of the Indian fertilizer industry and have started exploiting the shortage through clever pricing.

GOVERNMENT POLICIES AND INDIAN FERTILIZER INDUSTRY

Government policies and Indian fertilizer industry share a direct nexus, with pricing mechanisms, productive growth and subsidies forming the crux of the economic objectives of the government. The government policies for the fertilizer industry are devised to ensure a sustainable growth and development path in one of the most intensive sectors of the Indian economy. Growth, production and usage of the fertilizer industry are directly dependent on the government policies. Production of food grain in India derives the main stimulus for its growth from the fertilizer industry. The government has intervened time and again in determining the prices, movement and distribution of the fertilizers and its successful policies have pitted India as the third largest consumer and producer of the agro-input in the world after China and the United States. The policies pursued by the government are devised in response to the recommendations of the high-powered committees of the country. The Sivaraman Committee Report (1966) highlighted the importance of the balanced use of fertilizers along with providing adequate credit support for its distribution and usage. The committee also provided inputs for realizing the importance of liberalization of fertilizer marketing that would promote the production of the domestic companies.

The Retention Price Scheme introduced by the government followed the recommendation of the Marathe Committee that explored the possibilities of maintaining the farm gate prices of fertilizers. This would enable the government to maintain prices of the fertilizers during the time of crisis. The first decontrol policies of the government were introduced in 1992 on the recommendations of the Joint Parliamentary Committee. Phosphoric and potassic fertilizer industries were decontrolled by the government while urea industry continued to produce under subsidized rates.

The complex fertilizer industries were subdivided into two categories in 2001 after the modification of the 1998 Tariff Commission. Group I comprised of imported ammonia or industrial units using gas while Group II included industries using naphtha or fuel oil. Concessions to the naphtha based units were more than the other group as this showed lesser efficiency.

Other committees provided recommendations on the methods of promotion, marketing, distribution and pricing of the fertilizers in India. Change in government policies is however often responsible for hampering new investments in the industry. Although the investment in this sector was Rs 20, 677 crore in September, 2007, most of the bottlenecked projects have not been cleared by the Department of Fertilizers. The industry will soar up new heights and create a new growth story with the clearance of the projects and the approval of the new policies.

WORLD FERTILIZER MARKET

First, when studying prices and price determination in any industry, one usually looks to a body of economic theory called industrial organization and relevant empirical studies to help provide answers. In perfect markets, prices will be determined by the forces of supply and demand, but the international fertilizer market is not perfect market. Table 2.19 indicates the level of concentration in the industry. The top five fertilizer consumers, namely, China, India, USA, Brazil and Indonesia, accounted for nearly 70 percent of fertilizer consumption while top five producers (China, Canada, Russia, USA and India) controlled about 60 percent of world fertilizer production. Exports of potash and DAP and MAP are highly concentrated in few countries and top six exporters (Canada, Belarus, Russia, Germany, Israel and Jordan) control 97.4 percent of world exports in case of potash and 88.4 percent in MAP and DAP. The share of top five urea exporters is 55 percent and in case of ammonia they control about 64 percent of world exports. Imports of fertilizer products are relatively diversified as top five importers of urea account for about 51 percent of world imports while in case of MAP, DAP and potash is nearly 50 percent. The results clearly show that world fertilizer market is concentrated.

TABLE 4

CONCENTRATION OF WORLD FERTILIZER PRODUCTION, CONSUMPTION AND TRADE

Product/ Nutrients	Countries	% Share of Top 10 in world
Consumption		
N	China (34.8%), India (15.5%), USA (12.4%), Pakistan (2.8%), Indonesia (2.8%)	78.9
P	China (31.5%), India (15.8%), USA (11.3%), Brazil (9.7%), Pakistan (2.7%)	80.3
K	China (24.0%), USA (17.3%), Brazil (15.2%) India (9.8%), Malaysia (3.9%)	81.3
N+P+K	China (32.2%), India (14.6%), USA (13.0%), Brazil (6.5%), Indonesia (2.5%)	78.1
Capacity		
N	China (26.9%), India (8.8%), Russia (7.7%), USA (6.0%), Indonesia (3.6%)	66.6
P	USA (21.0%), China (18.5%), Morocco (8.4%), Russia (7.4%), India (5.5%)	73.8
K	Canada (39.6%), Russia (12.7%), Belarus (11.1%), Germany (8.7%), USA (5.6%)	95.0

N+P+K	China (24.3%), Canada (10.4%), Russia (9.7%), USA (9.5%), India (7.6%)	75.9
Exports		
Urea	China (16.1%), Russia (12.7%), Saudi Arabia (9.4%), Ukraine (9.3%), Qatar (7.7%)	77.0
Ammonia	Trinidad (25.2%), Russia (18.7%), Ukraine (7.6%), Indonesia (7.3%), Canada (5.1%)	81.1
MAP and DAP	USA (33.8%), China (21.1%), Russia (19.2%), Morocco (9.0%), Tunisia (5.3%)	98.8
Potash	Canada (38.6%), Belarus and Russia (36.3%), Germany (11.2%), Israel (7.6%), Jordan (3.7%)	100.0
Imports		
Urea	India (18.0%), USA (17.5%), Brazil (6.1%), Thailand (4.9%), Turkey (4.4%)	64.8
Ammonia	USA (40.5%), India (9.2%), Korea Republic (5.7%), France (4.3%), China (3.9%)	77.4
MAP and DAP	India (15.5%), Brazil (15.1%), Pakistan (7.6%), Argentina (6.6%), Canada (4.5%)	66.4

Potash	China (15.1%), USA (12.7%), Brazil (11.5%), India (6.4%), Malaysia (2.9%)	57.7
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Source: Computed from Annual Reports Agrium (2009)

The world fertilizer markets have always been dominated by a small number of buyers and sellers. The five largest fertilizer companies in the world are, Yara (Norway), Mosaic (USA), Agrium (Canada), Potash Corp (Canada) and The Kali and Salz Group (Germany), which accounted for about 27 percent of total production in 2002 and increased their share to about 33 in 2007. Yara is global leader in nitrogen fertilizers with capacities of ammonia 5.8 million tons of ammonia, 4.8 million tons of nitrates (CAN and AN) and 4.1 million tons of NPK controlling about one-third global ammonia trade. The Mosaic Company which was formed in 2004 by business combination of IMC and the crop nutrition business of Cargill, is the world's top producer of phosphates, with an annual capacity of about 9.4 million tons, larger than the next three largest producers combined. Mosaic's potash production capabilities are the second-largest in the world, with an annual capacity of approximately 10.4 million tons. Potash Corp is the largest potash company holding about 22 percent of global capacity and 75 percent of the world's excess capacity.

INDIA'S POSITION IN WORLD MARKETS

India is one of the largest producer as well as consumer of fertilizers in the world and entry of India in world markets as an importer influences world prices significantly. Strong positive association exists between world price of urea and imports of urea by India.

CONCLUSION

The importance of fertilizers to agricultural production has made promotion of fertilizer use an important aspect of national policy in India. Almost all developing countries including India have, at various times and to different degrees, subsidized fertilizers. Subsidies have been widely used to stimulate increased fertilizer use and thereby bring about increased production and yields. Fertilizer subsidies were considered particularly important in inducing farmers to adopt high yielding varieties, which often depended heavily on fertilizers. Subsidies appear to have been successful in this regard. Therefore, with increase in fertilizer use over time, fertilizer subsidy has also increased. In India fertilizer subsidies increased rapidly during the post-reforms period and peaked in the second-half of 2000s. The fertilizer subsidy has increased from Rs. 4,389 crore in 1990-91 to Rs. 75,849 crore in 2008-09. As a percentage of GDP, this represents an increase from 0.85 percent in 1990-91 to 1.52 percent in 2008-09.

The general perception that about one-third of fertilizer subsidy goes to fertilizer industry is misleading because the underlying assumptions:

- i. that India's entry into world market as an importer does not affect world prices, and
- ii. world fertilizer markets are perfectly competitive, do not hold true.

The world fertilizer markets and trade-flows are highly concentrated and volatile and Indian imports have significant impact on world prices. Moreover, with shift from the earlier cost-plus based approach to import parity pricing (IPP), the Indian fertilizer industry would be exposed to the world competition, which would drive the inefficient units out.

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