CHAPTER - 13

CONCLUSIONS

To improve agricultural output fertilizers are essential elements or input, therefore fertilizer industry has a vital role in this regard. The fertilizer industry in India has had a chequered career which can be best understood by assessing its development in three distinct phases. Prior to independence this industry was virtually non-existent except for a few superphosphate factories, for example the first one was EI-parry with a capacity of 7,400 tonnes P₂O₅ per annum established in Ranipet, Tamil Nadu in 1906. In case of nitrogenous fertilizers the TISCO plant had some notional production of Ammonium Sulphate as a by-product in 1933. Two major events: the great Bengal famine in 1943 and serious food imbalance in the wake of partition, made India realize the need for growing more food on a planned and systematic basis, and consequently recognition of the important of fertilizers.

The second phase started with the first large size ammonium sulphate plant commissioned in Sindri in 1951 almost coinciding with the commencement of the planning process in the country. The real impetus for development of fertilizer came in 60's with agriculture getting top priority in the third plan, it is during the period 1961-62 to 1965-66, while a number of plants such as FCI-Sindri, NFL-Nangal, FID-Parny-Radras, RCF-Trombay, were commissioned in the early part of 1960s. The advent of HYVs optimising the onset of green revolution in mid 1960s, gave added
urgency to the need for a rapid growth of fertilizer production in the country.

Third phase began in 1960s because the fertilizer industry not only witnessed further acceleration by way of addition to fertilizer capacity and production but at the same time this industry underwent significant structural changes giving the completion of a truly dynamic industry. In the period of third phase industry went into setting-up most modern, large size plants incorporating essential ingredients of best available technology based on better feed stock, i.e. natural gas; these changes supported by adequate availability of natural/associated gas from newly found reserves in Bombay-high and south Basin region. Consequent of this was that, the share of nitrogen capacity based on natural gas increased from 13% in 1960 to 36.3% in 1987 which naphtha registering a corresponding decline from 52 percent to 33 percent during the same period. Another feature distinguishing this phase from rest two is the remarkable improvement in production performance of the industry between 1980-81 and 1987-88, the installed capacity for nitrogen increased by 66% from 4.6 to 7.5 million tonnes. The increase in production was even higher by 162% rising from 2.1 to 5.5 million tonnes of N. In regard of phosphates also, increase in production was about 172%, as against increase in installed capacity of 95% during the same period. This could not have been possible, but for the significant improvement in the capacity utilization rates. The four decades development of fertilizer industry has considerably bridged the gap between the demand and supply of indigenous fertilizers. This has made India a front ranking
fertilizer producing and consuming country. Substantial growth in capacity, both in absolute and percentage terms has been achieved during the last seventh five year plan.

Three important fertilizers widely used in this country are nitrogenous (N), phosphatic fertilizer \( \text{P}_2\text{O}_5 \) and potassic fertilizer \( \text{K}_2\text{O} \), substantial parts of nitrogenous and phosphatic fertilizer are produced indigenously and potassic fertilizer are imported for total consumption. Fertilizer industry has been developed since 1906, it is birth day of first signle superphosphate in Ranipet-Tamil Nadu. Today there are 55 fertilizer plants manufacturing a wide range of nitrogenous, phosphatics and complex fertilizers. Besides there are 90 units which are producing single-superphosphate in India.

Locations of fertilizer industry are determined with regard to various factors like physical, which deals with sources of raw material, energy and water resources, climate and relief; economic factors like labour supply. Transportation, capital management and market organisation, technological factors which include level of science and technology available etc.

Historical factors which deal with availability of sufficient industrial infrastructure, behavioural factors which relate to entreprenure idea of business operation and finally land with its availability in cheap and extensive form attracts the fertilizer industrial units to commission their plants and start commercial production of various kinds of fertilizers. Fertilizer growth and development could be looked at from various angles like, installed capacity improvement, and capacity
utilization. Before 1947 capacity of N was 3,000 tonnes and that of P 205 was 63 thousand tonnes. At the end of 1950, capacity of N increased to 10,000 tonnes and P 205 increased to 10,2000 tonnes. Likewise during (1951-56) first five year plan (F. FYP) to VII (seventh) five year plan (S-FYP). As on 1.10.90 the capacity of N increased and reached to 8147,000 tonnes (1629.4 times) and that of P 205 in the same period increased and reached to 2751,000 tonnes (43.6 times). This improvement in absolute and percentage terms of capacity installation was achieved in about 43 years which was effective time for fertilizer industry to develop and grow.

In terms of investment (financial outlay). Before 1947 in public sector investment was to the tune of 0.8 crore rupees and co-operative sector was non-existent and in private sector investment was to the tune of 2.5 and total financial outlay was 3.3. Investment in this industry increased and reached to 1105.5 crore rupees in public sector and co-operative sector came into existence in 1978 and financial outlay in this sector was to the tune of 97.6 crore rupees and in private sector it was 553.8 crore rupees and total financial outlay was 17.56.7 crore rupees. Investment further increased in all three sectors and reached to 4855.8 crores (6069.75 times) in public sector and 1954.1 crores (20.01 times) in co-operative sector and 2551.21 crores in private sector (1020.48 times) as on 1.10.1990 round about 43 years, total investment on the same day was to the tune of 3361.1 crore rupees (2828.4 times). From the analysis conducted in the previous chapter, it can be observed the Nitrogenous capacity increased tremendously. In second place was phosphatic
fertilizer. From the investment point of view public sector was first, and second position was occupied by private sector and the third position was occupied by co-operative sector. But increase in capacity and financial outlay was quite large and unbelievable during 43 years.

After a brief survey in capacity and financial outlay in fertilizer industry it is worth-while to survey briefly the production, import and distribution and consumption of fertilizers \((N + P_2O_5 + K_2O)\).

During the first year of first five year plan (F.FYP) the year 1951-52 the production of fertilizers \((N + P 205 + K 20)\) was 36700 tonnes, and import was 52000 tonnes, distribution was 65600 tonnes, and consumption was 65600 tonnes. All the variables increased tremendously and at end of seventh five year plan (S-FYP), the year 1989-90 the production of fertilizers increased and reached to 8542700 tonnes \((220.74 \text{ times})\) excluding production meant for non-agricultural purposes. The rise in import was fluctuating, it increased and reached to 3112500 tonnes \((59.8 \text{ times})\). Distribution was made more effective to satisfy the demand through different distribution channels, because government aimed at delivering fertilizers at the right place, right time, right price and in right quantity. Hence distribution of fertilizers increased and reached to 112886000 tonnes \((172.0 \text{ times})\). So also consumption increased in course of time and reached to 11571,100 tonnes \((176.6 \text{ times})\). All K2O is imported even today, due to non-availability of raw material. From this study it can be concluded that India has made a great development
and growth in terms of capacity installation, investment and production, import and distribution so also consumption in regards of fertilizers.

Fertilizer industry has gone through lots of changes during its life time. Initially in 1951-52, 100 percent production of fertilizer were Nitrogenous and phoshpatic such as AS and SSP, but today, various fertilizers are manufactured in the country for fulfilment of demand which exist, here in domestic market. In case of raw material consumption, to produce fertilizers, initially it was coke-oven-gas, but gradually raw material for input of fertilizer industry changed over time and today varieties of raw material are used e.g. electrical power, naphtha, fuel-oil and natural gas. Expansion in size of fertilizer plants has been observed. In the beginning ammonia plant was 60 tpd and today it is 1350 (tpd). Standard size for other fertilizer plants has also been increased but the new policy is to reduce the plants size so that small business houses also can enter this line of business in India. The production of fertilizers in India used to take place in two sectors namely public and private in initial stages, but in course of time the third sector, that is, co-operative came in to existence and presently all three sectors are playing important role, in the development and growth of fertilizers industry in India.

Efficiency in business operation is normally measured in term of capacity installed and capacity utilized. In the year 1969-70 capacity utilization of fertilizer plants was 53% and 52% in N and P 205 respectively. But as time has passed these plants
have been utilized effectively and capacity utilization has been
improved and it was 82.6% and 67.2% in 1989-90 in regard to N and
P 205 plants respectively. The policy regarding site selection
has changed. Initially site for fertilizer factory was selected
taking into consideration availability of raw material. But the
idea has changed and at present site selection is done, taking
into consideration nearness to market. Hence the conclusion is
that some years ago they were raw material oriented and now they
are market oriented. Investment pattern has also changed in
course of time, today in terms of investment fertilizer industry
is the second biggest industry next to steel. Prior to 1947 total
investment in this industry was only 3.3 crore rupees which was
contributed by public and private sectors. Then at a later stage
co-operative sector also entered in this line of business
activity and contributed a huge capital. At present out of total
investment of 9361.1 crore rupees the share of public sector is
4855.8 crore rupees and that of private sector is 2551.2 crore
rupees and share of co-operative sector is 1954.1 crore rupees,
so we can observe the change in investment pattern in this
industry which is a desirable pattern because at the time all
three sectors are present and monopolistic policies cannot be
practised in regard to production-distribution and consumption
etc.

Self-reliance in technology and design, engineering
activities are as important as self-reliance in production of
fertilizers. Right from the beginning government has supported
research and development, design and engineering facilities,
alongwith establishment of fertiliser plants. Today Indian
consultancy houses can undertake a complete job starting with feasibility studies, process design, basic engineering followed by detailed engineering, so also comprehensive procurement, construction and project management etc. so technology in this field is becoming totally indigenous in very near future. Many changes have taken place in import of fertilizers since 1951-52, lots of fluctuations in regard to fertilizers import have been observed, in the beginning nitrogenous fertilizers and very small quantity of phosphatic fertilizer were imported. But the trend shows that potassic fertilizer also entered in the list of fertilizers import and tremendous increase in the volume of imports was noticed from 1951-52 to 1989-90. In case of nitrogenous fertilizers it increased by 16.6 times and phosphatic fertilizers by 84.6 times and potassic fertilizers by 165.9 times and total fertilizers import by 70 times. In a similar way composition of import has under gone many changes; in initial stage low grade and single nutrient fertilizers like AS, ACI, AN, ASN, SOP were imported. But now high grade and multi nutrient fertilizers like DAP, MOP etc being imported. Direction of import has been also changed, the share of old fertilizer exporter to India is reduced and new fertilizer exporter to India from various parts of the world started exporting to India. Fertilizers used to be imported in bags but now it is being imported in a bulk form, the the position of India has changed in respect of fertilizer import and it is becoming a major fertilizer importing country. Import handling port also have been increased, and today not only major ports but also minor ports conduct the import activities in this regard and at present there
are 30 ports which are engaged in this business. Fertilizer import is controlled by government because it comes under essential commodities act, (ECA) (FCO-1957). The reason of fertilizer import is because there is a gap of production and consumption in domestic market and this is due to increase in consumption at a faster rate of production indigenously, no potassic fertilizer is produced in domestic market and total consumption is met through import.

Today India ranks four in term of production and consumption of N and P 205 after USA, China, and USSR. India's position at the beginning of first five year plan was 13th, then improved to 9th and today it is 4th. In terms of consumption of potassic fertilizer it ranks 7th after USSR, USA, France, China, Brazil and Poland. The government of India has been continuously helping the manufacturer as well as the consumer of fertilizers by paying subsidies; payment of subsidies has been an aid to fertilizer producers to remain in business and it is an aid to farmer to improve agricultural out-put, for nation as whole to receive cheap food grains which is basic necessity of every human being.

The fertilizer industry is the centre of economic development. It has brought about a link between agricultural and industrial sectors of economy and has helped them to develop and grow in course of time.

About eight wellknown fertilizer companies from private sector (but public companies), which were selected to make a survey of their physical and financial performance. These
companies are Coromandel Fertilizers Ltd., Dharmasi Morarji Chemical Co. Ltd., and EID - Parry (India) Ltd., Gujarat State Fertilizers Co. Ltd., and ICI India Ltd., Mangalore Chemical and fertilizers Ltd., Southern Petrochemical Industrial Co. Ltd., and also Zuari Agro Chemical Co. Ltd. The analytical study conducted in respect of these companies for the period of 1980 to 1987 shows that there were many fluctuations in their physical and financial performance due to internal and external as well as controllable and uncontrollable factors. The license capacity was installed in most of these companies and capacity utilization was quite high in some cases, more than 100% also, production was good and few of them used to involve in distribution of fertilizers being imported either by themself or by government. Financial performance was examined with the help of financial ratios, groupwise liquidity ratios, profitability ratios, leverage ratios and finally activity ratios. From liquidity point of view in almost all companies liquidity position was good except in few cases and they could manage to repay their short-term debts, though current Ratios and acid-test ratios were below the accepted standards in some companies. From profitability angle they always suffered from high cost of raw material and interest since fertilizer plants and fertilizer manufacturing units are highly capital intensive units. But after deduction of all costs they normally landed into 1 to 14 percent of net-sale as net profit, though in certain companies in particular year losses were also incurred; it was because of loss of production; we will explain this phenomenon in detail in coming sub-capter.
In view of the capital structure and capital gearing ratios of these companies, in most cases the ratios of borrowed fund to own fund (debt-equity ratio) was quite high, some times it reached to 4 and 6 times since this business is manufacturing and highly capital intensive and need advanced technology and equipment and falls under heavy industry after steel industry, but repayment of principal and interest was smoothly done by these companies in course of business operation.

Studies in regard to turnover of different assets show always high turnover and good performance except in those days and months, and years when market was down due to insufficient rainfall and low performance and less cultivation of land from agricultural sector.

Fertilizer industry is facing various problems. For better understanding they could be classified into: (i) economic, (ii) political, (iii) physical, (iv) technological, (v) human problems. Fertilizer industry faces above mentioned problems during commissioning of plants and in regular business operation. Economic problems are concerned with transportation, power supply, marketing, capital and management, low productivity, high cost of production, delay in commissioning and maintaining old and sick units. Political problems deal with government policies and external disturbances. Physical problems are related to raw materials, water supply and climates. Technological problems are related to mechanical breakdowns/equipment failure, pollution and safety. The human problem relates to labour unrest, strike, bandh. The first major problem
faced by fertilizers industry is mechanical breakdown/equipment failure. These problems are related to synthesis-gas compressors, turbines, heat exchangers, reformers, tubes, catalysts, risers, high pressure pumps and reaction vessels, the reason being bad design, poor quality of power supply and ageing of plants etc. About 45% of downtime and 55% of shut-down of ammonia plants in India is due to these problems. The second problem, since this industry is high power intensive, there is a severe power problem with respect to both quantity and quality. The first is related to inadequate supply and power-cuts imposed by state electricity boards and second is concerned with voltage dips and wide frequency fluctuations. The third problem could be in-adequate supply, in consistent quality and untimely supply of raw material with their increasing prices. It is a serious obstacle in the smooth running of fertilizer plants, their problem is mainly because they depend on either raw material or work-in-progress which are to be imported.

Fourth problem is labour, which related to low efficiency, inadequate supply and increasing cost of labour alongwith labour disputes, strikes, etc. which have been affecting adversely the quantity and quality of production, productivity of the plant, cost of production and industrial peace. The 5th problem could be transportation constraints for the procurement of raw-material and distribution of finished products. This problem is concerns with the unavailability of wagons, inefficient services, increasing freight charges, lack of infrastructural development, long distances, bad conditions of roads, sheer absence of proper roads specially in rural and
interior areas, difficulty in availability of diesel and its steeply escalating price, negligible role of coastal and inland water routes and seasonal demands of product. Sixth problem is related to marketing defects like transportation, storage, warehousing, credit and retail outlets. These could be inadequacy in the development of the marketing infrastructure due to deficiencies in marketing and marketing infrastructure: the real and potential demand could not be met effectively. Seventh problem is concerned with, unavailability of sufficient capital. Since fertilizer industry is capital intensive by nature and India being a developing country enough fund is not available for investment in this field, so this industry must depend on international loans and credit assistances. Due to financial constraints many units are shut-down, especially the units in public sector in eastern region are victims of various credit tie-ups due to resource difficulties. Air emissions, liquid effluents and solid wastes discharged by nitrogenous, phosphatic and NP/NPK complex plants create air, water, and soil pollution and ultimately adversely affect human beings, plants and animal life. Due to above problems fertilizer industry has suffered materially in production, financial outlay and expansion.