Chapter I :

I N T R O D U C T I O N

The fertiliser industry is an important contributory for the growth of agricultural sector. The development of this industry, in a country like India, is of utmost importance. Various economic issues which pertain to this industry may be classified into three groups : (i) issues pertaining to fertiliser production (ii) issues pertaining to fertiliser distribution and (iii) issues pertaining to use of fertiliser.

Issues pertaining to fertiliser production

Fertiliser can be produced from a variety of raw materials, the deposits of which are available only in a few regions of the country. Some of the raw material deposits, for example potash, are not available in the country. Other materials, for example rockphosphate, petroleum based raw materials such as naphtha, fuel oil, etc., are not available adequately. Due to rising prices of imported raw materials in the international market, emphasis has now shifted on the use of indigenous raw materials such as natural gas and coal.

The presence of raw material deposits are of no use if the technology to exploit such raw materials is not developed. In the field of process technology for fertiliser manufacture, our country has not made significant progress and, hence, we have to rely upon foreign collaborators. The process technology of fertiliser manufacture, especially nitrogenous and complex fertilisers, has made a remarkable progress in the world. Various engineering firms, who compete in the international market, have developed their own processes and each process has its own advantage over the other. The modification of process technology emphasise more on the reduction of utility consumption, i.e., power and water, and also the recovery of products from waste-liquids as well as gases. Thus, the selection of an appropriate process is of utmost importance.

Given the raw material sources, consuming regions and the available process technology, the location of a fertiliser plant should be selected at such a place which minimise the total transport cost i.e. transport cost of raw material as well as product.

Issues pertaining to distribution of fertiliser

Due to increasing imbalance in the indigenous demand and supply and also the presence of regional disparity in the production and consumption of fertilisers, the distribution

as well as prices of fertilisers are statutorily controlled in India. The shortage of covered wagons pose major bottlenecks to fertiliser transportation by the railways. This problem is further aggravated by the cross-movement of fertilisers in the country.

The private dealers do their business in the cities and, in the villages, fertilisers are distributed by co-operative societies. Since fertilisers are demanded by the village farmers who often face financial problems and also are ignorant about the modern farm practices, the concept of focal points was introduced, in Punjab in 1977, with a view to provide following facilities to the villagers.

(a) banking and credit facilities,
(b) agro-service centres,
(c) retail outlet for essential commodities and agricultural inputs,
(d) marketing yard,
(e) diesel/petrol pump,
(f) post office,
(g) veterinary hospital, and
(h) civil hospital.

Each focal point willbe located within five kilometer's distance from each village.

The interior areas of the country which are located very far from railway line, often face the problem of getting fertilisers and, in many places farmers have to travel several miles to get fertilisers. In hilly areas of eastern states also farmers face the problem of non-availability of fertilisers. In order to overcome this problem many road-head points have been declared as rail-head points. With a view to supply the fertilisers in all the regions of the country at uniform price, the Government of India is subsidising the transport cost. The prices of fertilisers are also subsidised in order to promote the consumption of fertilisers in the country. It is important to examine the success as well as implications of all such policies.

Issues pertaining to use of fertilisers

Inspite of various development programmes, which were initiated in the country, for the promotion of fertiliser use, per hectare consumption of fertiliser in India is very low as compared to many agricultural countries in the world. The soil research laboratories contribute significantly in tracing the deficiency of nutrient elements in the soils. The agricultural research institutes play an important role in the invention of seeds for high yield and also by recommending balanced doses of fertiliser nutrients for increasing crop yield in irrigated as well as dry farming.

Scope of the present study

In this study we are dealing with a group of interrelated issues which pertain to fertiliser industry. We have tried to examine the process technology and the input structure and factors which affect the input structure of various processes, which are used for fertiliser manufacture in India.

Fertilisers are produced from different raw materials and, in the past, the location of raw material sources have significantly influenced the location of fertiliser plants in India. Since fertilisers are transported over longer distances, it is important to examine the locational efficiency of existing fertiliser plants in India from the view point of their marketing regions. We will also examine the policies pertaining to fertiliser distribution, price stabilisation and transport cost equalisations in some detail in this study. Also we shall examine the economics of rationalisation in the prevailing system of fertiliser distribution in India.

Data base

In the earlier stages of the study some attempts were made to collect the data from individual factories and Fertiliser Association of India. But the information required for our purpose could not be collected due to certain business

secrets, which the industry maintain. Thus, the basic source of data for our study has been, the unpublished records of the Ministry of Agriculture and Irrigation and the Ministry of Fertilisers and Chemicals.

Data pertaining to despatches of imported fertilisers from the ports/buffer godowns to the consuming centres could not be collected from the Ministry. Hence, the pool-fertiliser distributing agencies were approached.

Other sources of data for our study were, various reports of the Government of India and the publications of the Fertiliser Association of India.

Limitations

Non-availability of certain data imposed certain limitations within which we had to confine our study. Data pertaining to district-wise despatches of fertilisers from the sources (factories, ports, buffer godowns) were not available. Hence the despatches of fertilisers from the sources to different States, Union Territories and Commodity Boards were taken into account.

While studying the transport cost minimization problem we have not taken into account the traffic load imposed on Railways by other commodities. Also we have not taken into

account the capacity of Railways to carry the fertilisers on the Broadguage, meterguage or narrowguage tracks.

Since the capacity of raw material production at the sources was not available, we could not investigate the problem pertaining to optimum location of fertiliser plants. However, an attempt is made to study factors which have governed the location of existing fertiliser plants. Whether the existing location of a particular fertiliser plant is economical or not has also been studied on the basis of available data.

The data pertaining to input structure could be collected only for a few fertiliser plants and that too only for two or three years. The data supplied by many fertiliser plants to the Ministry of Chemicals and Fertilisers were very ambiguous and, consequently, we could not make use of that data for our study.

The data pertaining to despatches of fertilisers from the sources of supply to the consuming ~~areas~~ were computed only for one year. The reason was that prior to 1978, not all records of the fertiliser despatches were available, and the despatches of fertilisers for a few months for the year 1979-80 were not entered in records while the data were collected, during 1980.

Some of the pool fertiliser distributing agencies maintained records in a haphazard manner. Consequently, some

of them supplied figures pertaining to daily despatches, some weekly despatches and others monthly despatches. These data were compiled to get the yearly despatch figures. Since the collection and tabulation of such data consumed much time, only one year's figures (i.e., 1978-79) were taken into account.

Chapter Scheme

Chapter second pertains to the growth of fertiliser industry in India. In this chapter, the factors which have affected the growth of fertiliser industry and its demand as well as production, in India, have been discussed.

Chapter Three pertains to process technology. In this chapter we have tried to point out the most crucial factors which influence the input structure in a fertiliser plant. In particular, we have examined the effect of capacity utilisation and scale of the plant on input coefficients.

In Chapter Four we have studied the locational efficiency of fertiliser plants in India, taking into account the input coefficients of various plants, the sources of their raw materials and the existing demand pattern.

Chapter Five deals with the importance of price control on fertilisers in India. The policies of the Government of India pertaining to fertiliser distribution, price stabilisation as well as transport cost equalisation have been discussed in detail.

Chapter Six is devoted to the development of a transportation model for the rationalisation of distribution system. Our results show how far the rationalisation in the system of fertiliser distribution would save the total transportation cost.

Seventh chapter gives the summary of all the chapters and important conclusions which are derived from our study.