A STUDY OF THE MARKETING OF FERTILISERS IN INDIA

THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF DOCTOR OF PHILOSOPHY UNDER THE FACULTY OF SOCIAL SCIENCES, UNIVERSITY OF COCHIN

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CERTIFICATE

This is to certify that the thesis, 'A study of the marketing of fertilisers in India' submitted by Shri V. S. Ramaswamy for the Degree of Doctor of Philosophy under the Faculty of Social Sciences is a record of original work done by him under my supervision and guidance.

Dr. N. Parameswaran Nair

Cochin - 22

Date: 15/4/83

CERTIFICATE

This is to certify that the thesis, 'A study of the marketing of fertilisers in India' submitted by me for the Degree of Doctor of Philosophy under the Faculty of Social Sciences is the original work done by me under the supervision of Dr. N. Parameswaran Nair, Professor and Director, School of Management Studies, University of Cochin. I also certify that this thesis has not previously formed the basis for the award of any Degree, Diploma, Associateship, Fellowship or any other similar title.

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PREFACE

The subject of fertiliser marketing has been of absorbing interest to me ever since I joined The Fertilisers And Chemicals, Travancore Limited (FACT, Udyogamandal) in 1964. However, until 1979, the idea of doing a research study on marketing of fertilisers did not enter my mind, though I had been publishing for many years, a number of articles in various magazines and trade journals on the different dimensions of marketing of fertilisers in India. The difficulty experienced in gathering the required data for some of these articles made me realise that fertiliser marketing in India is a very fertile subject for research. My association with Dr. M.V. Pylee former Vice-Chancellor of Cochin University and Dr. N. Parameswaran Nair, Director of the School of Management Studies of the Cochin University led to the translation of the idea into the present research project.

In 1979, I got registered with the University of Cochin for research on this subject. I had the good fortune to have Dr. N. Parameswaran Nair, as my supervising teacher.

The present topic of research was selected after much thought and deliberation. The possibilities and choices in this regard were many, for fertiliser marketing has been such an absolutely virgin area for research. To my knowledge, no one has so far worked for a Ph.D on this broad area. It was thought that the study being the first of its kind in the field should cover the subject in its entirety. It would have been possible to choose any particular aspect of this subject and investigate it in greater depth. Any one of the several dimensions of fertiliser marketing in India which are broadly examined in this dissertation would have been a suitable topic for such a study. But it was felt that a total study of the subject would be more valuable than the study of any single aspect of the subject in isolation. It was felt that an integrated and broad study of the subject would be more relevant in the existing context of investigation in the area.

As the topic chosen is very vast in scope, the dissertation had to cover a wide range of dimensions. It starts with an overview of Indian agriculture and the Indian fertiliser industry, and stretches on to the various aspects of fertiliser marketing - the fertiliser marketing system in the country, fertiliser transportation, fertiliser warehousing, pricing of fertilisers, distribution channels and marketing costs. An investigation of the structure of marketing costs in the Indian fertiliser business, based on a survey of the industry is an important part of the study. I hope that the study would stimulate further research on the subject of fertiliser marketing by the fertiliser industry, the government and the academic world.

I am extremely grateful to Dr. N. Parameswaran Nair, my supervising teacher for guiding me in this complex project with great devotion. Unmindful of the harsh demands made by me on his time, he guided me at every stage of the research, generously appreciating every piece of good work put in by me and gently correcting the mistakes committed by me in the research procedure and in the presentation of the research findings.

The management of FACT permitted me to pursue this project as a part time researcher. I acknowledge my sincere gratitude to my management. Several persons have helped me, in one way or the other, in this project. I acknowledge my gratitude to all of them.

V.S. RAMASWAMY

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CHAPTER - 1

THE SCOPE OF THE STUDY

This is a descriptive and analytical study. It investigates how fertilisers are marketed in India. It describes and evaluates the system of fertiliser marketing prevalent in the country at the time of this study (1979-82). The study, as the title will indicate, has been conceived on a large canvass and in very broad and generalised terms. Such a large framework has been chosen with the intention of investigating the task of fertiliser marketing in its totality.

Importance of the study:

Fertiliser is big business in India. It is becoming bigger year by year. It is, in fact, one of the fastest growing businesses in the country.

Fertiliser occupies a very significant position in the economy of the nation because of its central role in agricultural production. Agriculture accounts for nearly one half of the national income of India.[1] It is the largest single sector of the country's economy. And it is likely to be so for very many years to come. On the strength of agriculture, depends the ability of the nation to feed its growing population. In addition, agriculture has to provide the base for the growth of the other sectors of the economy.

Agricultural production depends heavily on fertiliser use. In the Indian context, the role of fertiliser in increasing agricultural production is particularly critical, since it is the most important input in introducing modern agricultural technology in the country.

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1. India 1980, Publications Division, Government of India, New Delhi, 1980. P.207.

India is the fifth largest consumer of chemical fertilisers in the world.[2] The consumption of fertilisers in India in 1981-82 was in the order of 14 million M.T. in terms of different fertiliser products and six million M.T. in terms of fertiliser nutrients. The value of fertilisers marketed in India in the year was more than Rs.2,900 crores excluding subsidies and sales taxes.[3] In fertiliser production too, India is well advanced. The country is the fourth largest producer of nitrogenous fertilisers and the eighth largest producer of phosphatic fertilisers in the world.[4]

There are 80 fertiliser manufacturing units in the country currently in production. 40 of them produce nitrogenous and complex fertilisers and the rest produce single superphosphate.[5] More units are under construction. And many of the units that are already in production have ambitious plans of expansion. The units are spread over the public sector, the private sector, the joint sector and the co-operative sector.

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2. Fertiliser Statistics, 1980-81
The Fertiliser Association of India (ed) New Delhi, 1981.p.III-16.

3. Fertiliser News, July, 1982.
The Fertiliser Association of India (ed) New Delhi, 1982. p.135.

4. Fertiliser Statistics, 1980-81, opcit; p.III-5

5. Fertiliser News, July, 1982, op.cit; p.82

The units, put together, produce more than 10 million M.T. of various fertiliser products per annum.[6] The investment already made in the fertiliser industry is of the order of Rs.5,200 crores.[7]

In tune with the growth of fertiliser production and consumption in the country, the fertiliser marketing job in India has also been growing rapidly. In the early stages of the fertiliser industry, 'technology' and 'production' commanded maximum attention. More recent times have witnessed a growing interest in the area of 'marketing' of fertilisers. As was already pointed out, today, more than 14 million M.T. of various grades of fertilisers valued at more than Rs.2,800 crores are sold in the country every year. An industry, with such a large volume of business and potential for further growth cannot afford to ignore the importance of the marketing function.

In fact, a mammoth effort in marketing and promotion of fertilisers is already on throughout the country. The fertiliser business involves, more than 110,000 retail outlets spread throughout the country.[8] The expenditure involved in the marketing of this commodity adds up to a staggering Rs.800 crores every year. The expenditure incurred by the various government departments on agricultural extension and fertiliser promotion are beside the Rs.800 crores spent directly by the fertiliser industry and trade. On transportation alone, the fertiliser business spends more than Rs.250 crores per annum.[9]

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6. For details please see page 82
7. For details please see page 70
8. For details please see page 298
9. For details please see page 338

An original study:

Despite the fact that the fertiliser marketing job is so mammoth in size, and so critical to the national economy, no independent and comprehensive study on the marketing of fertilisers in the country has been made so far. No doubt, various expert committees and governmental agencies as well as the Association of the Fertiliser Industry (FAI) have studied the different aspects of fertiliser marketing and distribution from time to time. But, almost all of them were piecemeal studies, each dealing in isolation with a particular aspect of the marketing job. None of the studies has attempted to research the problem in its totality. As far as we are aware, this study is the first of its kind made so far.

It is in this context that the present study assumes its significance. This study is an attempt to understand fertiliser marketing in India in all its aspects and dimensions in a unified manner. It deals with the entire gamut of activities involved in the fertiliser marketing job. It has been undertaken in the belief that fertiliser marketing in India deserves better attention and more expert handling, be it from the planner, the policy maker or the marketing professional.

The scope of the study:

The study as the title indicates has a very wide scope.

(i) It covers all the different types of chemical fertilisers that are marketed in India.

(ii) It is an all-India study. It covers fertiliser marketing in the entire country. The different aspects of fertiliser marketing have been studied from an all India perspective.

(iii) It covers all the major areas of fertiliser marketing such as product-mix, logistics, distribution, promotion, prices and subsidies and distribution margins and marketing costs. The main thrust of the study, however, is on the following core aspects of fertiliser marketing.

- Logistics
- Marketing costs
- Distribution margins

(iv) It covers all the agencies that are involved in the marketing of fertilisers in India, such as the government, the domestic fertiliser industry, the import handling agencies, the cooperative net work and the private trade.

(v) The study also evaluates the various policies that have been enforced by the Government from time to time on the marketing and distribution of fertilisers in the country.

C H A P T E R - 2

RESEARCH METHODOLOGY

In designing the study, it was felt that no single research method would completely meet the total demands of the research project. Accordingly, a mix of research methods was employed in the project. Basically, the mix consisted of desk research and field survey. The latter consisted of two parts-a postal survey aided by a questionnaire and depth interviews aided by a schedule. The field survey was a census survey of the fertiliser industry. The data obtained from the field survey was integrated with the data generated through desk research.

There was a certain amount of overlapping in the methodology employed for generating a particular component of data from different sources/respondents. Likewise, there was some overlapping in the methodology employed for generating different components of data from the same source/respondent. The methodology employed generally ensured an integrated research approach throughout the study. The entire research work is based on latest available authoritative data.

The details of the methodology chosen for the research study and the details of how the study was actually carried out are furnished below.

Initial desk research:

Initially, desk research was carried out for a period of six months. Intensive effort was made to generate the maximum possible data from the primary and secondary sources that were accessible. Later on, desk research was continued side by side with the field survey.

One of the first steps taken towards desk research was to develop a comprehensive bibliography of all primary and secondary source materials. Continuous additions and deletions to the bibliography were made as the desk research was in progress. The bibliography thus collected was classified as shown below:

- Books.
- Technical journals.
- News paper articles.
- Expert Committee reports.
- Government publications.
- Industry/Trade Publications.
- Annual reports of fertiliser companies.
- Papers/proceedings/reports of seminars and conferences.
- Year books, Directories and hand books.
- Abstracts of relevant technical literature.

The bibliography is given at the end of the thesis. A list of the libraries that were perused is given in Appendix - I, page 376.

The data generated by the initial desk research helped to clarify further the subject of research. It facilitated the decision as to what specific areas of fertiliser marketing should be taken up for more intensive research. Moreover, based on the data already gathered through the initial desk research and based on the clear selection of the specific areas for more intensive study a through investigation was done regarding the additional data that would be required to carry out the research study.

Inadequacy of desk research:

It became clear that by desk research alone the study could not be completed. A number of inadequacies were noticed in the data generated through desk research. The important ones among these inadequacies are mentioned below.

- In some cases the data was incomplete.
- In some cases, thedata on the same subject obtained through two different sources did not tally with one another. Some of the data was also sometimes misleading.
- The data had undergone some 'processing' by those who had used it in the first instance to suit their particular purpose.
- Data on some items was not available on a comparable basis. It was difficult to reduce the available data to a common comparable basis.
- The headings under which some of the data had been included did not have comparable definitions. For example, headings, like 'Primary transport' 'Secondary transport', 'Promotional activities' etç,, meant different things to different people.
- Some of the data required for the research was of a 'confidential' nature and was not available in published form. Desk research could not reveal such 'confidential' information.
- A good part of the data related to the latest period - i.e. 1979-1981. It had to be gathered from the source through direct efforts as they were not yet available in published form.

Field survey:

In view of such inadequacies of the desk research, it was decided to carry out a field survey to supplement desk research and to generate the required primary data.

As the first step, the primary data that was to be genereted through the field survey was clearly identified. Then a plan for obtaining such data was developed. The pros and cons of a census survey versus a sample survey of the fertiliser industry were considered. The census survey was preferred.

It was felt at one stage that the field survey could be a sample survey of the fertiliser industry with a view to generate the required unpublished data on the marketing practices and marketing cost structures of the various fertiliser firms. This was, however, felt to be quite inadequate. It was concluded that a census survey would be necessary to meet the objectives of the study. This was felt for several reasons. The most important reason was that each fertiliser firm, whether it be in the private, public or cooperative sector, had its own marketing system, and cost structure. A sample survey would not have been enough to bring out these widely varying systems. Accordingly, it was decided to carry out a census survey of the fertiliser industry.

It had also to be decided whether the field survey could be a factual survey or an opinion survey or a combination of both. It was initially felt that a combination of factual and opinion survey would be the best, since it would bring out not only the required factual data, but also the opinions of the respondents. The respondents were chief marketing executives of the various firms. They were men with considerable expertise in the field. It was felt that their opinions would be useful. But, based on the insights gained from the pretesting of the questionnaire, this decision was reversed and a factual survey was chosen. Further, opinion survey would have had full value only if the opinions of all the executives in the different firms were to be collected. This would have been a nearly impossible task, considering the very large number of persons involved and the constraint of time. It was decided that only the chief marketing executives will be included as respondents and that the survey would be limited to mere collection of facts.

It was also decided that the survey would be a postal survey to be supplemented with personal interviews where responses were not forthcoming at all or were not forthcoming in the expected manner. It turned out that in almost all cases, the personal interview became inevitable. In many cases, more than one interview became necessary.

The formation of the schedule posed several problems. As the subject to be studied is very vast and complex and a large volume of statistics on distribution, sales, marketing costs, etc., had to be obtained through the survey, a suitably designed questionnaire was used.[1]

The sources to be tapped were listed. As the decision was to carry out a census survey, all the fertiliser units currently in production in the country were included in the list. However, units which make single superphosphate (SSP), Triple Superphosphate (TSP), Ammonium Sulphate (A.S.) and Calcium Ammonium Nitrate (CAN) were left out. Their marketing operations are not comparable to those of the

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1, For a copy of the questionnaire, please see Appendix II, p. 377

larger units which manufacture urea and complex fertilisers. Moreover, these units taken together form hardly 10 percent of the fertiliser industry of India.

Just as the sources to be contacted were first listed out, the types of data thatwere required from them were also listed out and with the help of this, the questionnaire was developed. A clear procedure was also worked out for collecting the data from the appropriate sources. A follow up scheme to remind the silent respondents and gather the required data was also used, wherever necessary.

The field survey was conducted based on detailed planning and scheduling. The draft questionnaire was pretested with a few knowledgeable persons and was refined, taking into account the suggestions given by them. The improved questionnaire was again pretested with a cross section of the respondents, before it was administered to all the respondents. In fact, the original questionnaire underwent a good deal of modification on the basis of pretesting.

The questionnaire was pretested with six fertiliser units. Typical responses from them were as follows:

- The questionnaire is too long, with too many questions.
- The questionnaire demands highly specific and intricate data. Such data will not be readily available. It will take a good deal of time to collect and furnish the data.

- Some of the data sought is too confidential to be provided.
- Data cannot be given in the form and manner demanded by the questionnaire.
- The questions solicit both 'facts' and 'opinions'. It may be better to restrict the questions **to** 'facts'.

The questionnaire was revised, taking into account these comments and responses. The revised questionnaire meant a drastic condensation of the original one. It also meant a lot of simplification. And whereas in the original questionnaire, questions eliciting facts and opinions had been included in the light of the pretesting experience, questions seeking opinions were **excluded from the revised** questionaire

Administration of the field survey:

The questionnaire was mailed to all the respondents. Three respondents sent back the questionnaire duly filled in, without any reminder being sent to them. In the case of others, a vigorous follow up by means of postal reminders, telephone calls and personal contacts had to be made. Four of the respondents suggested on their own accord a detailed personal discussions on the subject of the research and on the questions involved in the questionnaire. In the case of the others, even though they did not suggest personal interview for furnishing the data it became necessary to do so. Sometimes more than one interview had to be conducted with the same person to gather the data. The same mailed schedule was used in conducting the interview also.

In effect, what was originally conceived as a postal survey turned out to be a personal interview survey.

The interviews were quite useful. Even those who had not, at first, taken the mail questionnaire seriously, were full of cooperation when face to face discussions were held. Moreover, the interview technique provided a certain amount of flexibility unlike the mail questionnaire. It facilitated the adjustment of data collection to the extent to which the individual respondent was willing to go in sharing the data. It made possible the collection of certain factual data which might not have been forthcoming in the mail survey. In some cases, the respondents came out with additional data and ideas on the subject on their own accord. Thus the extent of accuracy, completeness and reliability of the data automatically improved with the interview technique.

The interview, belonged to the direct and structured type. The pre-structured schedule was employed and it was administered directly (in person). Recording of the responses to the questionnaire took place simultaneously with the interview. All the interviews were done by the research scholar personally.

Subsequently, the data collected through the questionnaire was once again checked. All the missing data was collected through further correspondence/telephone contact.

Analysis and integration of data:

On completion of the field survey, the data that was generated through the survey was analysed in detail. Some additional data became necessary in the light of the field survey. This was obtained through further desk research. The data gathered through the field survey and the desk research were compared with each other wherever the two were relatable. Then, the data obtained from field research and desk research were integrated. Once the integration of all the data gathered through the different methods was completed, the entire data was analysed systematically. Finally, a frame work was developed for the presentation and interpretation of the data. The data-frame work has delimited the contours of the dissertation.

CHAPTER - 3

INDIAN AGRICULTURE - AN OVERVIEW

A general survey of Indian Agriculture as it exists today and a description of its potential for growth will be useful in understanding the problems related to the marketing of fertilisers in India.

The place of agriculture in Indian economy:

The importance of agriculture in the overall economic structure of a country like India can never be over emphasised. Agriculture forms the backbone of Indian economy. Three fourth of the total population of the country depend on agriculture for their livelihood. And half of the national income is contributed by the agricultural sector.[1] Agriculture also supplies the raw materials to a large section of India's Industry. Industries in cotton, jute, sugar, rubber, etc., as well as the food processing industry depend totally on agricultural commodities. A substantial portion of the country's exports is also provided by the agricultural sector. Agricultural commodities like tea, coffee, tobacco, jute, spices, etc., are major foreign exchange earners for India. As it is, agricultural commodities account for half of the country's total exports. Obviously, the production and utilisation of the various farm

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1. India 1980, Publications Division, Government of India, New Delhi, 1980. p.207.

commodities have a strong bearing on India's national economy.

Unlike in the developed countries, in India, agriculture has continued to maintain its pre-eminent place in the national economy even after the country went through a good measure of industrialisation. In most of the developed countries, agriculture lost its pride of place in the national economy when industrialisation took place at a rapid pace. Where as, in India, as much as 72 percent of the total population continue to depend on agriculture as the main source of livelihood, in U.K., only three percent of the population is engaged in agriculture. In U.S.A., it is four percent; In canada eight percent; In France it is 14 percent. Where as, agriculture and allied occupations in India contribute to 45 percent of GNP, in U.K., agriculture contributes to only three percent of GNP; in U.S.A. too it is three percent; In Canada it is five percent and in France it is six percent.[2]

Of late, several industries in India have turned their eyes on the vast rural markets of the country. The future expansion of business in consumer goods in the country will depend heavily on the prosperity of the rural people, which in turn will be a function of agricultural advancement. Dr. Wortman has brought this out nicely. He says, "Only by extending science based, market oriented agricultural production systems among great masses of rural people can most

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2. Sankaram, Dr. A; A witness to an era of Indian Agriculture Dr. A.Sankaram, Madras, 1979, p. 10 and 60.

countries substantially expand their domestic markets for products of urban industry".[3]

The above observation is especially relevant to India. Many firms in the Indian consumer goods industry have already started looking at rural India as a land of immediate promise and not merely as a distant heaven.

This would indicate that agriculture and industry are not in any way antithetical in the Indian context. They are just the two faces of the same coin. In fact, agriculture can be described as the largest industry in India. India's prosperity is inextricably bound up with prosperity in the agricultural sector.

A critical evaluation of Indian agriculture:

Indian agriculture has many strengths and weaknesses. A critical evaluation of both the strengths and the weaknesses is essential for obtaining an overview of Indian agriculture.

Strengths of Indian agriculture:

The robustness of the soils of India constitutes the prime strength of Indian agriculture. India has continuously fed populations of mammoth size. The soils of India have had the inherent strength to sustain such cultivation. To quote Sir Hutchinson,

> "The striking contrasts between India and Africa - both low-level production agricultures till quite recently, the one carrying a very high population and the other,

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3. Wortman, Dr.Sterling; Accelerating Agricultural Development (Coramandel lecture), Coramandal Fertilisers Limited, New Delhi, 1977.p.4.

A very low population is that the soils of India, in contrast to the soils of Africa, stand up to continued cultivation for a very long time. Four thousand years of agriculture, sometimes with two crops a year, have still left the soils of India in a form in which they respond to amelioration by modern techniques in spite of this exploitative agriculture for so long a period. It is no exaggeration to say that one can do more damage to the soils of Africa in four years than has been done to the soils of India in four thousand years. It is just this that the soils of India are robust and responsive.[4]

India has a total geographical area of 329 million hectares, which equals the entire area of Europe, excluding U.S.S.R.[5]

With a gross cropped area of 173.92 million hectares and an irrigated area of 48.41 million hectares in 1977-78, India ranks third in area of cultivated land (after the USSR and USA) and first in irrigated land. India cultivates nearly 45 percent of its geographical area. Approximately three-fourths of total cropped area is devoted to foodgrains.[6]

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4. Hutchinson, Sir.Joseph, B; The Strategy of Agricultural development (Coramandal lecture), Coramandal Fertilisers Ltd., New Delhi, 1970. p.4.

5. India 1980, op.cit; p. 207.

6. Balu Bumb, A survey of the fertiliser sector in India, staff working paper No. 331, World Bank, Washington,1978 p. 3 & 4.

Performance of Indian agriculture:

Between 1951-52 and 1980-81 India's food grains production went up from 52 million tonnes to 130 million tonnes. Production of sugarcane went up from 61.6 million tonnes to 151 million tonnes. Production of groundnut went up from 3.2 million tonnes to 5 million tonnes[7].

Since weather plays a vital role in agricultural production, it will perhaps be more appropriate to compare farm production between two periods of three consecutive years each rather than to make a straight comparison between any two years. A comparison of crop output between 1949-50 to 1951-52 and 1976-77 to 1978-79 is given in Table-1.

TABLE-1.

Changes in crop output from 1949-50 to 1978-79[8].

Crops	Average annual production 1949-50 to 1951-52	Average annual production 1976-77 to 1978-79	Increase in production. (B-A)	Percentage increase
	A	B	C	D
Rice	23,259	49,472	26,213	112.70
Wheat	6,640	31,914	25,274	380.63
Total cereals	47,683	111,147	63,464	133.09
Pulses	9,452	11,835	2,383	25.21
Foodgrains	57,135	122,981	65,846	115.25
Oilseeds(five major items)	4,958	8,796	3,838	77.41
Sugarcane (Gur)	6,958	16,614	9,656	138.78
Cotton (lint)	3,019	7,003	3,984	131.96
Jute	3,923	5,723	1,800	45.88

Note:- 1. Figures for all crops except cotton and jute are in thousand tonnes.
Cotton: In thousand bales of 170 kg each
Jute: In thousand bales of 180 kg each

7. Fertiliser statistics,1980-81, The Fertiliser Association of India, New Delhi, 1980. p. II-25.
and
Report, 1981-82, Ministry of Agriculture, Government of India,1982 pp. 105 & 106.

8. Swaminathan, Dr. M.S.; "Indian agricultural scene" in FAI(ed) Development of fertilisers in India, The Fertiliser Association of India, New Delhi, 1980. p.4.

It can be seen that output has been more than doubled in the intervening period. This is true if we take cereals alone or all food grains. This is also true of sugarcane and cotton. In the case of wheat, the performance is even more striking - the levels of output have been more than trebled. It is apparent that India's agricultural production has taken impressive strides since the country attained its independence.

The Phenomenon of 'Green Revolution'.

These achievements have been particularly outstanding in the years that followed the advent of India's 'Green Revolution.' The spectacular growth in food grains production, especially in wheat, in the latter half of the 1960's is commonly referred to as India's Green Revolution. The Green Revolution brought new hopes to the country by achieving a break through in agricultural production by the application of modern agricultural technology.

The beginnings of India's Green Revolution can be traced to the year, 1966-67. Referring to India's food production efforts in the latter half of 1960's, Dr. W.David Hopper mentions,

> "The year 1966 must be counted as the founding year of the so called 'Green Revolution'. It was the year in which the scientists knew certainly that the biological basis for an immense increase in grain output was at hand. They had a solution to the long sought goal of achieving a sizable increase in India's food production".[9]

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9. Hopper, Dr.W.David; A perspective on India's food production (Coramandal lecture) Coramandal Fertilisers Ltd., New Delhi,1976. p.1.

The Green Revolution was the direct result of the initiative to try out a technological solution to the country's sluggish progress in agricultural productivity. In the earlier stages, the main sources of increase in farm production were increase in the area brought under the plough, increase in the area under irrigation and changes in the cropping pattern and locational shifts among the different crops. But after the Green Revolution, the increase in farm production largely came from the use of technology. Technological break through was the clear goal of the new initiative. The strategy was implemented with boldness. It paid off.

Factors contributing to the Green Revolution:

The main factors that contributed to the Green Revolution were:

- High yielding crop varieties
- High level of irrigation and
- High use of fertilisers

This is forcefully brought out by Dr. Hopper. He says, "The transformation of Indian farming was based on the productive interaction of plant nutrient (chemical fertiliser) assured and timely crop moisture and grain varieties capable of responding to high applications of each". [10]

Most analysts of India's Green Revolution agree with this view.

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10. Ibid;

There is no doubt that the agricultural progress was rapid and steady in areas where high yield-cum-high stability technology was available in combination with assured irrigation.

The strategy centered around intensive cultivation, adoption of modern farming, extension of area under high yielding varieties, increased use of fertilisers and plant protection chemicals and better management of water. According to Dr. A. Sankaram,

> "Green revolution has been essentially a process of modernisation based on science and technology and five different revolutions in five different sciences have made their contribution to the Green Revolution. The genetic revolution brought the high yielding crop varieties, the chemical revolution brought the fertilisers and plant protection chemicals, the engineering revolution enhanced the efficiency of cropping and removed the drudgery of farmers in multiple and intensive cropping, the communication revolution through press, radio, T.V., farm visits, training etc. enabled the dissemination of the new farm technology and finally the management revolution enabled the intelligent manipulation of the inputs for the highest out-put".[11]

A more detailed analysis will however throw up several other factors in addition to the three main factors listed earlier as contributors to the Green revolution. The following factors are

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11. Sankaram, Dr. A; op.cit; p.VI

in particular, noteworthy.

- The right 'know-how' of farm production
- Transfer of the 'know-how' to millions of farmers through effectice extension
- The right varieties of seeds (High Yielders)
- More and better irrigation
- Rural electrification
- Chemical fertilisers
- Plant protection chemicals
- Adequate and timely availability of credit (finance) for the farm operations
- A favourable price relationship (favourable to the farmer) between inputs price and produce price
- Appropriate post harvest technology and facilities for 'marketing' of the produce and for 'processing' the produce wherever necessary
- The willingness of millions of farmers to try out the new farming technology.

Some of these factors need elaboration. It may be appropriate to take up the last mentioned factor first.

The role of individual farmers:

Among the factors that made India's green revolution possible, special mention has to be made about the remarkable role of the thousands of farmers who took to the new farm technology with enthusiasm and faith. Dr. Sterling Wortman, President of International Agricultural Development Service underlines this aspect when he says:

> "Scientists and industry have provided the building blocks for today's advanced agricultural systems,

> but let us not forget the role of the more progressive farm producers in the equally sophisticated task of putting together for the individual farm the components of productive and profitable systems." [12]

Touching on the same aspect, Dr. W.David Hopper demolishes the myth of 'unchanging traditionality of the Indian farmer' and pays a handsome tribute to the role played by the so called tradition bound farmer of India in the agricultural transformation. He says,

> "The rapid spread of the new practices among farmers should lay to rest the vision of the Indian agriculturist as a stubborn, changeless robot slavishly following his inherited agricultural traditions. I have a particular pique with the too often repeated cliche that 'What can you expect? They have been doing ir for a thousand years, and why should they change now?' I have yet to meet a thousand-year-old farmer, and I can think of many reasons why farmers of any age might wish to change if new methods, more efficient and profitable methods are shown to them".[13]

High yielding varieties programme and
<u>massive use of chemical fertilisers:</u>

The high yielding crop varieties have played a great part in the green revolution. It will be no exaggeration to say that the advent of the high yielding crop varieties especially in wheat literally triggered off the green revolution.

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12. Wortman; <u>op.cit;</u> p.3

13. Hopper, <u>op.cit;</u> p.12 & 13

The big thrust in the High Yielding Varieties Programme (HYVP) came in 1967-68 and there has been no going back, since then, on this programme. Year by year, the acerage under HYVP increased, though the actual rate of increase was not uniform in every year.

The use of High Yielding Varieties seems to have a definite correlation to the consumption of fertilizers. The table below shows the growth in the HYVP coverage, the increase in fertiliser consumption and the increases in food grain production over different years after the advent of the Green Revolution.

TABLE - 3.

HYVP Coverage and fertiliser consumption 1966-67 to 1978-79 [14]

During	Gross area under HYVP (million ha)	Fertiliser consumption N + P + K (million MT)	Food grains production (million M.T.)
1966-67	1.9	1.10	74.2
1967-68	6.1	1.54	95.1
1968-69	9.2	1.76	94.0
1969-70	11.4	1.98	99.5
1970-71	15.4	2.26	108.4
1971-72	18.2	2.66	105.2
1972-73	22.1	2.77	97.0
1973-74	26.0	2.84	104.7
1974-75	27.0	2.57	99.8
1975-76	31.9	2.89	121.0
1976-77	33.6	3.41	111.2
1977-78	38.0	4.29	126.4
1978-79	41.1	5.12	131.4

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14. John, Dr. Easo, "Growth in fertiliser consumption in India" in ~~[illegible]~~ Development of fertilisers in India, The Fertiliser Association of India, New Delhi 1980, p.154.

It would appear then that the High Yielding varieties and chemical fertilisers are 'made for each other', each thriving in the company of the other. The High Yielding varieties are able to achieve their full yield potential only with high doses of application of chemical fertilisers. Conversely, the traditional varieites seem unable to absorb large doses of fertilisers. High fertiliser consumption is thus related to the adoption of the HY varieties. As Easo John says,

> "It is the close relationship and synergetic effect between the High Yielding Varieties and chemical fertilisers that enabled the food grains production in the country to scale new peaks". 15

The HYV which responded quickly to fertiliser application increased farmers' confidence in the use of fertilisers and made the communication on this aspect quicker and easier. The marketing of fertilisers received a great fillip in this respect.

Dr. M.S. Swaminathan points out:

> "Cultivation of high yielding varieties of crops is a major plank of the new strategy for increasing agricultural production. Till 1978-79, a total of 42 million hectares of area had been brought under high yielding varieties of rice, wheat, maize, jowar and bajra. It, however, accounts for about 40 per cent of the area under these crops and points to the vast untapped potential for increasing crop output, especially the food grains." 16

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15. Ibid; p. 155

16. Swaminathan, op.cit; p.14

Characteristic features
of the green revolution:

The green revolution has not been a uniform phenomenon in Indian agriculture. It has not touched all the crops in the same measure. It was predominantly a wheat revolution. The levels of increase in the output of other crops bear no comparison to the spectacular increase in the yields of wheat. Geographically too, the greenrevolution has not been a uniform phenomenon all over the country. Different regions in the country have benefited in different measures from the green revolution. The revolution has taken place mostly in areas of assured irrigation. It would be mostly true to say that practically the entire rainfed agriculture of India is yet to experience the revolution.

Again, large and medium farmers have been the main beneficiaries of the green revolution. The revolution has almost totally bypassed the small and marginal farmers of the country. This happened not because the new technology behind the green revolution was inapplicable to the small farmers. In fact the technology behind this revolution was scale neutral. The difficulty was that the technology was not resource neutral. The small and marginal farmers did not have the resources to make use of the new agricultural technology.

The more one studies the impact of the green revolution, the more one understands that so much more has to be done for broad-basing the revolution over the entire country and over the entire range of crops in the country. However, the significant point is that the spectacular success brought about by this revolution, though limited to a few crops and to a few regions, has become the pace setter for the growth of Indian agriculture in general. The green revolution of India has also demonstrated that nations can succeed in agricultural programmes if they have the will. It has also demonstrated that the farmers of any country, however traditional they are, will try new technology if they are given the means and motivation.

Weaknesses in Indian agriculture:

The strengths and achievements of Indian agriculture, described in the foregoing paragraphs may give a very rosy picture of ~~Indian~~ Indian agriculture. In reality, Indian agriculture is not totally rosy. There are several weaknesses and inadequacies in Indian agriculture. An evaluation of Indian agriculture will remain incomplete without an analysis of its weaknesses.

Some of the weaknesses of Indian agriculture stem from policy constraints and therefore are rooted in the present. But several other weaknesses are rooted in the past and are attributable to the social and economic structure of the country. The major weaknesses of Indian agriculture are discussed below briefly.

(i) Too many people depend on agriculture:

To begin with, in India, a very large percentage of population depend on agriculture. India is the ~~the~~ second most populous country in the world with a population of 684 million as per 1981 census. It is growing at the rate of more than a million per month. And three fourth of this population depend on agriculture. A vast majority of this large section still remains illiterate and extremely poor. A good percentage still consider farming more as a way of life than as an occupation or a commercial venture. They can do only 'subsistance farming'.

(ii) Uneconomic farm holdings:

It is common knowledge that a majority of India's farm holdings are thoroughly unviable and uneconomic for science based and commercial farming. As per the agricultural census 1970-71, there are 705 million operational holdings in the country, spread over an aggregate area of 16.2 million hectares. The average size of a holding is 2.30 hectares out of which the net area under cultivation is 2.06 hectares. The heavy preponderance of marginal holdings, estimated at less than one hectare, is one of the dominant features of the operational holdings. One half of the operational holdings are less than one hectare, 19 percent between one and two hectares and 15 percent between two and four hectares. Medium holdings measuring four to ten hectares account for 11 percent. 2.8 million holdings or less than 4 percent of the total are of 10 hectare and above. They account for 50 million hectares. In other words 84 percent of the total farm holdings in the country belong to less than four hectares category and 96 percent of the farm holdings belong to less than 10 hectare category.[17]

(iii) Dependance on vagaries of weather:

Despite all the technological break through, Indian agriculture depends on the vagaries of weather to a large extent. The country has not been able to impart a good measure of stability to her agriculture, free of weather conditions. As already mentioned, India achieved an all time record food grains production of 132 million M.T. in 1978-79. But, the very next year, food grains production slumped to 108 million M.T., the lowest level in recent years.[18] The drought in the country during that year had caused such a steep fall - a fall of 20 percent of the total annual output. It is likely that the story may get repeated

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17. Fertiliser Marketing News, March, 1976, The Fertiliser Association of India, New Delhi, pp. 5-7

18. Please see page 25 above.

this year, i.e. 1982-83, though the fall in production this year may not perhaps be so steep as in 1979-80. But, such a sliding down once in every three or four years due to drought is a pointer to the weakness in Indian agriculture.

Apart from droughts, many other natural hazards like floods, cyclones and hail storms cause enormous loss to agriculture in India, practically every year, though in varying measures. The country is yet to put into practice systematic disaster management.

(iv) Preponderance of dry farming:

Despite the fact that India has the largest irrigated area in the world, three fourth of Indian farm lands still remain unirrigated. During 1977-78, the percentage of irrigated area to total cultivated area was only 25.8.[19] As per the Agricultural census, 1970-71, the 70.5 million farm holdings in the country are made up of 12.4 million wholly irrigated holdings operating over an area of 12.1 million hectare; 17 million partly irrigated holdings covering an aggregate area of 46 million hectare of which the irrigated component adds up to 17 million hectare; and 41 million wholly unirrigated holdings operating over a total area of 77 million hectare.[20] These do not enjoy any sort of irrigational facilities but, depend entirely on rain. Also there are 6.3 million wholly irrigated holdings in the country of size less than half an hectare.[21]

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19. Fertiliser Statistics, 1980-81, op.cit; p.II 9
20. Fertiliser Marketing News, March 1976, op.cit; pp. 5-7
21. Ibid.

This means that more than half the total number of wholly irrigated holdings belong to the sub-marginal category.

(v) Low levels of productivity:

Indian agriculture is also characterised by low levels of productivity. While the country ranks very high in the total production of several agricultural commodities, the productivity ~~of India~~, in almost all these commodities, is extremely low by international standards. India is the second largest producer of rice in the world but India's productivity (yield per hectare) in rice is the lowest among the major rice producers in the world with 1792 kg./ha. Japan has a productivity of 6240 kg., China 3717 kg. and Pakistan 2508 kg. Similarly India is the fourth largest producer of wheat in the world. But India's productivity in wheat is one of the lowest, if not, the lowest in the world. It stands at 1574 kg./ha. as compared with 5212 kg./ha. in U.K., 4773 kg./ha. in France and 3618 kg./ha. in Mexico.[22]

The International ranking of India in productivity is very low not merely in wheat and rice, but practically in each and every crop. This can be seen from Table 4 below.

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22. Food and Agriculture organisation, Production Year book - 1979, FAO, Rome, cited by Fertiliser Statistics 1980-81; op.cit; p.III

TABLE - 3

Crop	India's International Ranking in productivity 1977.[23]	
	Area	Productivity
Rice	1	36
Wheat	4	35
Pulses	1	46
Potatoes	4	36
Ground Nuts	1	37

(vi) Imbalances in agricultural production and productivity among different crops and different regions:

Another major weakness of Indian agriculture becomes evident when we make intercrop and interregional comparisons in production and productivity. There are extremely wide variations in out put increase and productivity among the different crops grown in the country. There are equally wide variations in out put increase and productivity among the various states/regions in the country.

(vi.a) Crop to crop variations:

During the period between 1960 and 1979, foodgrains (cereals plus pulses) production grew at the rate of 2.56

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23. Extracted from Appendix III on page 381.

percent per annum, nonfoodgrains grew at the rate of 2.23 percent and cereals production grew at the rate of 2.94 percent per annum compounded. Pulses recorded a negative growth. Growth in oil seeds output was only 1.5 percent.[24]

The growth in production of coarse cereals was especially discouraging.[25] In a way, it points out to the lack of development of dry farming since, a good part of the coarse cereals are produced under dry farming conditions. Grains like jovar, bajra, maize, ragi, small millets and barley belong to the family of coarse cereals. An unhappy feature of this relatively poor development of coarse cereal production is that the economically vulnerable sections of Indian farmers constitute a major part of the coarse cereal growers. Lack of growth in this segment has partially been the cause of regional imbalances in agricultural advancement and uneven distribution of the fruits of green revolution in the country.

<u>State to State variations:</u>

Such variations are present not only among different crops but also among different states and regions.

For example, whereas Punjab has had an average yield of 2449 kg. per hectare of wheat during 1975-76 to 1977-78,

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24. Swaminathan, op.cit; p.7

25. Ibid; pp. 8 & 9

Madhya Pradesh had only 821 kg. The all India average yield of wheat was 1425 kg. In the case of rice, Punjab, again, came up with an average yield of 2887 kg. in the same period. Madhya Pradesh had only 793 kg. The all India average was 1215 kg. More details regarding State to State variations in crop productivity are presented in ~~the~~ Table – 4 ~~given~~ below.

TABLE – 4

Variations in yield levels from State to State[26]

Crop	Average yield of crop(1975 to 1978) State	Yield - kg./ha.
RICE	Punjab	2887
	Orissa	896
WHEAT	Punjab	2449
	Karnataka	667
PULSES	Punjab	2307
	Andhra Pradesh	274
SUGARCANE	Tamilnadu	96982
	Madhya Pradesh	30684
OIL SEEDS	Tamilnadu	971
	Himachal Pradesh	318
COTTON	Punjab	351
	Maharashtra	72
JUTE	Orissa	1509
	Bihar	964

26. Ibid; p.20

The inescapable conclusion from all this is that modernisation of agriculture in India has been an uneven process. The extent of technological progress varies widely from one farming system to the other, from one region to the other and from one crop to the other.

A technology-gap in
agriculture still persists:

Despite the green revolution, there is still a technology gap in Indian agriculture. The country is yet to develop location specific and crop specific farm technology for some of her farming systems. A standard or proto-type farm technology does not work in India because the country is so vast and so heterogeneous, with agroclimatic and agro-economic conditions vastly varying from region to region and even from one district to another within a state.

In the case of dry farming, undoubtedly a big technology gap exists even today. This is also true of cultivation in hilly tracts. Crop varieties and production technologies eminently suitable for these cropping systems are not yet available. Similarly the country is yet to provide a farm technology that will suit her innumerable small and marginal farmers who account for as much as 70% of the farming population of the country.

Providing location specific farm technologies and production strategies in a country like India is by no means an easy task. The fact that a very large number of farmers and farm households have to be involved in the task of agricultural development in India and the fact that those farmers do farming under vastly varying conditions make the job all the more difficult. In the words of R. Thamarajakshi,

> "Increasing agricultural production in India is an intricate task considering that production decisions are taken by innumerable farmers who cultivate under diverse agro-climatic conditions and range all the way from largely subsistence farmers to largely commercial operations".[27]

Even in those regions and farming systems where an improved farm technology is already working well the country has to learn to operate in still higher planes of technology if she has to reach anywhere near her potential or the levels that have already been reached by the agriculturally advanced countries.

Apart from the gap in the farm technology, there is also a gap in transferring the available farm technology. There

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27. Thamarajakshi R, "Indian Agriculture", in The Hindu, Madras, dated 4-9-1978, p. xxx

is a time gap, a quality gap and a volume gap in this field.

) Poor per capita production of foodgrains:

A ~~One of the~~ major weaknesses of Indian agriculture has been its inability to overtake the rate at which population has been growing. Viewed in absolute terms, the country's achievement in increasing food production may be impressive. But the food production in India on a per capita basis is still very very low. The out-put increase has not got sufficiently accelerated to off-set the growth in population. In many years, per capita availability of food grains remained stagnant, the out-put increase barely matching the population increase. And in the remaining years the per capita availability has actually declined.

On an indepth analysis of the net per capita availability of food grains in India it can be seen that between 1950-51 and 1970-71, over a period of 20 years, the country could register only a paltry increase of 27 kg. in per capita annual availability, Still worse, in the next six years, more than half of the previous 20 years' increase was nullified. The per capita availability dropped to 158.7 kg. in 1976-77 from 171.1 kg.in 1970-71. The table 5 below illustrates the position, separately for cereals and pulses and for total food grains.

TABLE - 5

Per capita availability of food grains in India[28]

Years	Per capita net availability of food grains		
	Cereals	Pulses	Total food grains
	(Kilograms per annum)		
1950-51	122.0	22.1	144.1
1960-61	145.9	25.2	171.1
1970-71	152.4	18.7	171.1
1976-77	142.8	15.9	158.7

It can be seen from the Table that the per capita food availability has not only stagnated over several years but has even declined considerably in certain time intervals. In relation to other countries also India presents a very poor picture in per capita food supply.

> "During the period 1975 to 1977, the developed countries of the world had a food supply of 3373 calories per capita per day. The developing countries had only 2282 calories. India's position was deplorably low at 1949 calories. The world average for the same period was 2600 calories. Even China had almost caught up with the average; the corresponding figure for China was 2439 calories. The figure for Soviet Russia was 3443 calories." [29]

Even during the time intervals when the per capita availability of food had gone up in India on account of food production growing

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28. Swaminathan, op.cit; p.11

29. The Economic Times, Bombay, dated 25-1-1981, p.8

marginally faster than population, the per capita consumption of food had not gone up. Apparently mere availability could not lead to more consumption in the absence of purchasing power. In fact, the surplus and overflowing buffer stocks of food in some years are directly attributable to this phenomenon. It suggests 'under consumption'rather than 'over production'.

Commenting on the aspirations of India to become a food surplus and food exporting country, The Hindu of Madras in an editorial mentioned as follows:

> "Mention is constantly made of the self sufficiency in foodgrains that has been achieved by now. What Government spokesmen conveniently gloss over is the fact that it is only because of the lack of purchasing power and the existence of a sizeable number of people below the poverty line that there is an illusory plenty about the harvests." [30]

V.I. Chaco illustrates this point by comparing the position of India with that of U.S.S.R. in this regard. He points out, "The U.S.S.R., with a population of 260 m. has problems with a food grains output of 230 m. tonnes whereas we find a surplus with a production of 115-120 m. tonnes for a population of over 600 m." [31]

The inference is obvious. The 'surplus' of India and the 'deficit' of U.S.S.R. are indicative of the very high per capita consumption of food in U.S.S.R. and very low per capita consumption in India.

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30. The Hindu, Madras, dated 18-12-1980, p.8

31. Chaco V.I; "Rural development and modernisation of Indian agriculture" in Deshpande Arvind & Bapat S.B. (ed) Indian Agriculture - Performance & Potential, Jaico, Bombay, 1980. p.162

The potential performance gap in Indian agriculture:

An incredible gap exists between the absolute maximum production potential of Indian agriculture and current levels of output. S.K. Sinha and M.S. Swaminathan have estimated the absolute maximum production potential in terms of a grain equivalent for India by dividing the country into 10 major soil type groups. Their analysis indicates that the absolute maximum production of grain equivalent in India may be 4,572 million tonnes per year.[32]

Such estimates of absolute potential are macro estimates arrived at on the basis of several broad generalisations and assumptions. One major assumption is that the entire land will be utilised for producing grains. This assumption may not be valid in actual practice. Considerable land will be utilised for growing fruits, forest produce, feeds, fibre etc. And the absolute potential will perhaps never be achieved at all, even if the entire land were put to grain production. Nevertheless, these estimates, serve as pointers to the size of the untapped crop production reservoir existing in the country.

Taking due note of the limitations of these estimates, it can be seen that a very big gap exists between the absolute maximum production potential of India's agriculture (4572 million M.T.) and the highest level of food production achieved so far (134 million M.T. in 1981-82).

32. Swaminathan; op.cit; p.26

Even the target aimed in the sixth five year plan by 1985 is only 154 million M.T. of food grains. This wide gap between the ultimate potential of agricultural production and current level of output in India is a pointer to the immensity of the scope for further development in Indian agriculture as well as the colossal nature of the efforts required for bridging this gap. What has been achieved in the past few decades pales into insignificance when compared with the potential that can be realised.

The absolute maximum production potential being a mere theoretical concept, it would be worthwhile to compute a more tangible production potential for the country which is capable of practical realisation within definite time limits. Two tangible yardsticks can be considered in this regard, viz. the yields obtained in the National crop Competitions and the yields obtained from the National Demonstrations Programmes both carried out on the farmer's fields. Table-6 given below illustrates the gap between current average yields in the country and the yields demonstrated in the crop competitions and the demonstration programmes.

<u>T A B L E - 6</u>

<u>Yield levels attained in India 1970-71</u> [33]

Name of Crop	(Yield (kilograms per hectare)) National average yield	National crop competition yield	National Demonstration yeild
Rice	1123	15862	5610
Wheat	1307	16117	4070

33. Department of Agriculture, Govt. of India, New Delhi (unpublished statistics.)

The immense scope for pushing up crop output levels from the existing averages will be evident from the above figures, especially the yields from the National Demonstrations. Dr. M.S. Swaminathan elaborates this as follows:

> "A comparison of yields of National Demonstrations and average yields in various states shows that there exists tremendous potentiality to increase yield of crops, though the yield potential differs from state to state. For instance, it is quite feasible to increase yield of paddy from 1.24 to 3.50 times. Similarly, depending upon the state, wheat production can be increased by 1.5 to 4 times the present level. For bajra, the ratio varies from 1.72 to 2.80. For jowar, it varies from 1.07 to 3.95. In the case of maize, the potential varies from 1.44 to 5.23 times the existing level".[34]

All these indicate the potential-performance gap in Indian agriculture and the possibilities of much higher crop output even with existing farm technologies. This is not obviously beyond the capability of the country. For after all, it has been achieved in certain regions of the country like Punjab. An effective extension service supported by adequate and timely supply of inputs and necessary infrastructure can certainly at least double our annual production capacity.[35]

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34. Swaminathan; _op.cit_; p.25

35. _Ibid_.

THE FUTURE OUTLOOK FOR INDIAN AGRICULTURE:

Having discussed in detail the strengths and weaknesses and the apportunities and threats of Indian agriculture, it may be appropriate to mention briefly what the future - immediate and distant, holds for Indian agriculture.

The most encouraging feature of Indian agriculture in the past few years is that science and technology have left an indelible impact on its advancement. Gone are the days of total dependance on antiquated methods of cultivation. A majority of the Indian farmers have seen with their eyes what the technological breakthrough could do to agriculture in India eventhough ~~[illegible]~~ all of them might not have enjoyed its fruits in the same measure. The breakthrough has triggered off a new revolution - the revolution of rising expectations among large farming communities of India. The Government has also gained the confidence and expertise for taking the nation to further heights in agricultural development from the stage of 'take-off' that has already been reached.

Self-sufficiency in food output, even at low level of percapita consumption is by no means a small achievement for a nation of India's population combined with its backwarness. The various agricultural programmes launched over three decades, have contributed to this achievement in production and productivity. The agricultural scientists and researchers, the extension men, the planners, policy makers and administrators, the various agro-inputs manufacturers and above all, the farmers of the country have all made their contribution towards this achievement.

It has been demonstrated that the nation has the capability for solving its farm production problems. The infrastructure for agricultural growth has been created to a reasonable extent, though inadequacies in this respect still exist in varying measures in varying parts of the country. A solid base ~~has been created~~ for the provision of the required inputs for farm production has also been created.

It is now a question of carrying forward the good work and the good results already accomplished.

AGRICULTURE IN SIXTH
FIVE YEAR PLAN:

The revised Sixth Five Year Plan (1980-85) has accorded a high priority to Agriculture. The basic strategy adopted by the plan for crop production is to increase the productivity of the area already under cultivation, to increase the area under irrigation, increase the cropping intensity and ensure larger application of inputs. This will be backed by improved agronomic practices for higher efficiency through a strengthened extension system. A growth rate of nearly four percent in the output of the agricultural sector is expected to be achieved during the Plan.

The farm production targets set by the plan for the terminal year of the plan - i.e. 1984-85 are as follows:

TABLE - 7

AGRICULTURAL PRODUCTION TARGETS - VI FIVE YEAR PLAN [36]

Crop	Assumed base 1979-80	Plan target 1984-'85	Compound growth rate in the plan period
	(in million M.T.)		
Rice	51.24	63.00	4.2
Wheat	35.64	44.00	4.3
Other cereals	29.27	32.10	-
Total cereals	116.25	139.10	-
Pulses	11.61	14.50	-
Total Food grains rounded to.	127.86 (128)	153.60 (154)	- 3.9
Oil seeds (5 major items)	9.32	11.10	-
All Oil Seeds	10.20	13.00	5.0
Sugar Cane	175.80	215.00	4.1
Cotton(In million bales of 170kg.each	7.34	9.20	4.6

The plan relies heavily on fertiliser use for achieving the above targets of farm production. It has envisaged a near doubling of fertiliser consumption in the five year period, as can be seen from the targets shown below:

36. Planning Commission, Government of India, VI Five Year Plan; 1980-85, Planning Commission, New Delhi, 1980. pp.119-120

TABLE - 8

Fertiliser consumption targets - VI Five Year Plan[37]

	Assumed base 1979 - 80	Plan target 1984 - 85
	(in million M.T. of nutrients)	
Nitrogenous Fertiliser (N)	3.50	6.00
Phosphatic Fertiliser (P)	1.15	2.34
Potassic Fertilisers (K)	0.61	1.31
Total (N + P + K)	5.26	9.65

Note: All the above figures are in terms of fertiliser nutrients. The consumption target for 1984-85 will be more than 23 million M.T. if it is expressed in terms of fertiliser products.

In conclusion, it has to be stated that India has the potential to solve her agricultural production problem but the solution is not an easy one. Sustained efforts will be required, year after year, to achieve and maintain self sufficient levels of production in each segment of the farm sector.

Fertilisers have played a crucial role in India's agriculture in the past three decades, especially since 1966-67. In fact, fertiliser use has become the kingpin of the farm strategy chosen by India since 1966-67. The role of fertilisers in Indian agriculture will become all the more important in the years to come as agriculture in many other parts in the country gets modernised.

This is the larger setting in which the use of fertilisers and its distribution have to be viewed.

37. Planning Commission, Government of India, VI Five Year Plan 1980-85 op.cit; p.105

CHAPTER - 4.

THE PLACE OF CHEMICAL FERTILISERS IN INDIAN AGRICULTURE

Evolution of fertiliser use in the world:

It was Karl Marx who first foresaw the far reaching implication of the invention of chemical fertiliser in Germany by Liebig and other scientists. He asserted that the new chemical would explode all theories of diminishing returns of land. Nothing could have been more prophatic ! The new chemical did explode, in an astonishing manner, the law of diminishing returns of the soil. With the new wonder chemical, it was possible to continuously improve soil fertility and crop production. In the first half of the twentieth century, thanks to fertiliser use, world agricultural production increased like never before. The continents of Europe and North America, in particular, created a great upsurge in agricultural productivity through the use of chemical fertilisers. In the second half of the twentieth century, other countries of the world, including India, joined this process of agricultural productivity increase.

Tracing the evolution of manuring in general, Sir J.B. Hutchinson says:

"Manuring is an ancient practice. Doubtless it began when observant farmers saw that they reaped better crops in those areas where wastes and refuse from human and animal feeding were deposited. Modern manuring practice began with the systematic use of wastes to improve crop production in the Netherlands".[1]

This process continued through the Middle Ages and the Netherlands was a large scale demonstration of the rewards of manuring. England copied this technique from the Netherlands. Many other countries of the world also used organic manure in varying measures to improve and maintain the soil fertility. But, till the invention of chemical fertilisers, the 'transfer of soil fertility' remained confined to the four walls of the farming system. There was no addition to the world's agricultural fertility from outside the farming system until the invention of chemical fertiliser and the resultant understanding of the true nature of soil fertility.

Even after the invention of chemical fertilisers, there was no immediate jump in the addition of fertility to the soils of the world. To quote Sir. Hutchinson again,

> "Fertiliser use began very slowly. In 1845, the U.K. only used 50,000 tonnes of fertiliser and most of it was guano, which in fact is of organic origin. There was only a slow increase during the next 70 years; guano was replaced by Sodium Nitrate and Ammonium Sulphate, but even by 1942, the consumption of all nutrients had only risen to 2,50,000 tonnes. But since the end of the war, the increase has been very rapid and in 1964, Britain used nearly one and half million tonnes of the major nutrients. World consumption has shown a similar pattern of increase"[2].

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1. Hutchinson, Sir. Joseph, B. The Strategy of Agricultural Development, (Coramandal Lecture), Coramandal Fertilisers Ltd., New Delhi, 1970. p.5

2. Ibid; p.9

By 1979-80, the United Kingdom consumed 2.4 million tonnes of chemical fertilisers, in terms of nutrients. The world consumption in that year was 112 million tonnes[3].

Evolution of fertiliser use in India:

For a long time, chemical fertilisers did not find a significant place in the time honoured practices of Indian agriculture. Though the use of chemical fertilisers in the country was started by the beginning of the twentieth century, it was quite meagre and was confined for quite sometime to the plantation crops like tea & coffee. A little later, it spread to sugarcane. But the use of chemical fertilisers for food crops like wheat and paddy was slow to pick up.

Royal Commission on agriculture, 1928:

Evidénce about the conditions existing in the first quarter of this century in the matter of fertiliser awareness and use in India, is available in the report of the Royal Commission on Agriculture headed by the Marquess of Linlithgow. This report came out in 1928.

To quote from the report:

> "Of the principal plant-food materials in which the soils of India are deficient, by far the most important is nitrogen, and the manurial problem in India is, in the main, one of nitrogen deficiency. India, as is well known, depends almost exclusively on the recuperative effects of natural processes in the soil to restore the combined nitrogen annually removed in the crops, for, but little of this is returned to

3. **Fertiliser Statistics 1980-81**. The Fertiliser Association of India, New Delhi, 1981. pp.III-17

the soil in any other way. Much of the farmyard manure available is burnt as fuel whilst a large quantity of combined nitrogen is exported in the form of oil-seeds, food and animal products such as hides and bones. This loss is in no way compensated by the importation of nitrogenous fertilisers".[4]

It is evident that at the time of the Royal Commission Report, there was very little awareness about fertilisers and very little fertiliser use in India. There was continuous depletion of the nutrients in the soils but very little addition of nutrients to the soils from outside the farming system. The country made no effort to import fertilisers to feed the hungry soils of India. In fact a good part of whatever nutrients were available in the country were exported. This included most of the bones and bone meal and the Ammonium Sulphate produced in Tata's Steel Plant at Jamshedpur.

It is also significant to mention that at the time of the Royal Commission report, Nitrogen deficiency was the only one identified. Neither phosphatic nor pottassium deficiency was talked about in India.

'Grow More Food' Campaign 1943:

In 1943 some attempt was made in India to popularise fertiliser use for food crops under the 'Grow More Food' Campaign. But, during that campaign there was an unwanted controversy about the role of chemical fertilisers and organic manure. As a result, the farming community remained confused about fertiliser use. It took quite some time before fertiliser use caught up in India for food crops.

4. Report of the Royal Commission on Agriculture, 1928, cited by Sivaram.B, "Fertilisers in Indian agriculture", in Fertiliser Association of India,(ed) Development of Fertilisers in India. New Delhi 1980. p.34.

Post independence period 1947-1966:

It was after the country attained independance in the year 1947 and especially after the launching of the five year plans, that fertilisers use in India showed good increase. The rate of increase was however not anywhere near the required level in the fifteen years following independance. Programmes like the National Extension Scheme and the Community Development Programme did contribute in some measure to the increase in fertiliser use in the country, during this period, but the impact was not very significant.

By 1961-62, fertiliser use in India went up to 3,10,000 tonnes in terms of nutrients.[5] In 1961, the National Extension Scheme and the Community Development Programme were given up as unsuccessful experiments in modernising Indian agriculture. These programmes were replaced by the Intensive Agricultural Development programme (IADP) and the Intensive Agricultural Area Programme (IAAP) popularly known as the package programme. The IADP and IAAP programmes that were adopted in several districts did give a filip to fertiliser consumption. The programmes emphasised the package approach to achieve, agricultural productivity.

The next stage in fertiliser use in India came as the outcome of the programme of the Indian Council of Agricultural Research (ICAR). The

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5. For details please see page 83, Chapter 6.

programme consisted of coordinated agronomic trials and intensive fertiliser promotion. A significant feature of this period was the contribution of the fertiliser industry which competed with and complimented the efforts of government agencies in fertiliser promotion in the country.

Advent of green revolution:

The advent of the green revolution in 1966 and its impact on Indian agriculture was explained in detail in chapter-3.[6] Modernisation of India's sluggish agriculture by means of a technological break through was the goal of the green revolution. Improving productivity of the already cropped area was clearly accepted as the source of increasing agricultural production. Adoption of high yielding varieties and massive use of fertilisers under better conditions of irrigation were identified as the tools for achieving the goal. Intensive cultivation received maximum emphasis. Simultaneously, fertiliser availability and fertiliser promotion were expanded. The result was a big jump in fertiliser consumption. The close relationship among increased adoption of high yielding crop varieties, larger use of fertilisers and increased agricultural production was explained in chapter-3.[7] The significant growth in fertiliser consumption in the years that followed the advent of green revolution will be explained in greater detail in Chapter-6.

The importance of chemical fertilisers in the Indian context:

In chapter-3 it was mentioned that agriculture is the main stay

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6. Please see Chapter-3, page 20

7. Ibid; p.25

of the economy of India.[8] Chemical fertilisers play a key role in agriculture. And, in the Indian context, the role of chemical fertiliser in agriculture is unique. It is not without justification that fertiliser is described as the king pin of the farm strategy of India.

In India, there is not much scope for increasing the area under cultivation. The strategy has got to be one of continuously increasing productivity per unit of cropped area per unit of time. As the National Commission on agriculture has pointed out in its report, "Because of the narrow land-man ratio which would get still narrower in coming years, the only hopeful means of supplying needs of agricultural produce would be by raising the productivity level."[9]

It was also mentioned earlier that two third of the cropped area in India is under rain fed conditions.[10] It may not be possible to make any spectacular jump in the area under assured irrigation in the immediate future. This factor also tends to reinforce the dependance on fertiliser use as a major source of future increase in agricultural production in the country.

The importance of chemical fertilisers in Indian agriculture can be easily understood from the close relationship between fertiliser use and crop production in the country. Admittedly, crop production

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8. Please see chapter-3, pp.15-17.

9. Report of the National Commission on Agriculture, cited by Sivaraman, B, op.cit; p.31

10. Please see Chapter - 3, p.30.

cannot be attributed to fertiliser use alone. Several other factors especially weather, influence crop production. Yet, an analysis of the trends in fertiliser use and food production in India reveals the strikingly close relationship between the two.

An year by year analysis of fertiliser use and food production between 1966-67 and 1978-79 was made in chapter-3[1]. This analysis will show clearly the close relationship between fertiliser use and food production in India. Table-1 below shows the relationship between fertiliser use per unit of cropped area in the country and yield of food grains per unit of cropped area.

TABLE-1.

Fertiliser consumption per hectare and food grains yield per hectare[2]

Year	Fertiliser consumption kg./hectare			Yield of food grains kg./hectare
1951-52	N	- 0.44	NPK - 0.55	536
	P	- 0.05		
	K	- 0.06		
1961-62	N	- 1.60	NPK - 2.17	705
	P	- 0.39		
	K	- 0.18		
1971-72	N	- 10.88	NPK -16.14	858
	P	- 3.38		
	K	- 1.88		
1978-79	N	- 19.85	NPK -29.70	1025
	P	- 6.42		
	K	- 3.43		

#1. Please see page 25 chapter.3.

(2) Fertiliser statistics 1980-81, op.cit. p.I.92 & II.26.

Basic aspects of
soil fertility:-

To understand correctly the role and importance of chemical fertilisers in crop production, it is essential to have an appreciation of the basic aspects of soil fertility. Management of the soil is, indeed, the key factor in scientific agriculture. And, correct evaluation of the soil status and soil fertility is the first step in managing the soil. Sir, Hutchinson points out,

> " The management of soils today is the key feature of agricultural strategy. All the nutrients that the plant requires except Oxygen and Carbon-di-Oxide, it obtains from the soil. The soil is the reservoir, the supplier, the repository of all ingredients and by-products of organic life. On the health of the soil depends the whole of organic life, both the plant life rooted in it and the animal life living on the plant." [13]

It will be evident from the above statement that the soils must always have a buffer stock of plant nutrients.

Organics and chemical
fertilisers:

The soils and crops, no doubt pick up a good part of the

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13. Hutchinson, Sir. Joseph B., Op.cit; p.2.

plant nutrients from nature. Fertilisers are essentially a supplement to the nutrition that a plant obtains from nature. Addition of organic manure of various types also supplements the process. The organic manure plays a vital role in improving the physical structure of the soil apart from supplying the nutrients to the soil. Organics are essentially a recycling process - bringing back to the farms, nutrients from within the farm system. Chemical fertilisers on the other hand are a net addition of nutrients from outside the farm system. With organic manures alone, it is not possible to replenish all the nutrients removed by the crops. Application of chemical fertilisers therefore becomes inescapable.

Bio-fertilisers or
Bacterial fertilisers:

Apart from the recycling of organic wastes back to the farm, there is another promising source for augmenting soil fertility. This is the biological source and the products from this source are referred to as bio-fertilisers or bacterial fertilisers. They are actually, microbial inoculants. Like the organics, the bio-fertilisers also play three roles in the soils. They supplement the chemical fertilisers by fixing nutrients from nature; they also enhance the availability and efficiency of whatever nutrients that already exist in the soil as a bank. In addition, they improve the quality of the soil in general.

A full discussion on bio-fertilisers is not attempted here. It is enough to say that great scope exists in this field.

Integrated Nutrient Supply System:

From the foregoing,it is clear that there are several routes to improved soil fertility and that there are several components that make up and maintain the fertility of the soil, In the interests of efficiency and economy, the various sources of plant nutrients should be tapped in the right combination and in an integrated manner. They become more valuable, more productive , more efficient and more cost-effective when applied as part of a system - an integrated nutrient supply system rather than in isolation. An integrated nutrient supply system will ensure a 'total approach' to soil fertility evaluation and a 'total cost approach' in making available the required nutrients.

Improving the efficiency of fertiliser use:

Fertiliser is not only a very productive input, but also a costly input. It is imperative that the use efficiency of every tonne of fertiliser applied to the soil is increased to the maximum extent possible. In India,the scope for improving the use efficiency of fertilisers is enormous, since the present level of use efficiency is generally low. It has been pointed out that

" The utilisation efficiency of various fertilisers in the farmers fields is generally low. In case of nitrogen it may vary from less than 30 per cent in low land rice, to 50-60 percent in irrigated crops grown in dry season. As regards phosphate, only 15-20 percent is utilised by the first crop. Normally the utilisation efficiency of potassic fertiliser is fairly high (about 80%). However under certain situations this may drop to a relatively lower figure if appropriate measures are not taken. These low efficiencies compounded with increasing prices of fertiliser materials due to rise in petroleum prices makes the point of increasing fertiliser use efficiency very important."[14]

Ambika Singh and N.P. Singh are of the view that "In field experiments, recovery of the Nitrogen applied is less than 50%."[15] According to Goswami and Sarkar, "Available evidence shows that about 6,000 million M.T. of soil and 2.5, 3.8 and 2.8 million M.T. of N, P, K respectively are lost annually in India."[16]

In any farming system, a running battle is going on all the time between two different processes - the process of uptake of nutrients by the plants and the process of loss of nutrients from the soil, whatever may be the reason. If one of these processes is weak, the other is the winner of the battle. It should be the endeavour to strengthen the process of uptake of nutrients bythe plants and weaken the process of nutrients loss. A variety of factors are involved in

14. Roy R.N. and Subhash Cnadra, "Improving the efficiency of fertiliser use in India" in Fertiliser Industry-1979, Bombay, 1980. p.112

15. Ambika Singh and Singh N.P. "Time and method of fertiliser application under limited availability", in FAI (ed) Proceedings of FAI-FAO seminar, 1974, F.A.I. New Delhi; p.289.

16. Goswami M.N. and Sarkar M.C., "Nutrient losses from soils - Mechanisms and magnitude and ways to minimise them" in Proceedings of FAI-FAO seminar, 1974. op.cit; p.223

this process. They can be classified into two main categories as shown below:-

I. Ecological Factors:

- Soil type
- Climate
- Extent and spread of rainfall

II. Agro Technical Factors:

- Proper crop programming and crop sequencing
- Choosing the right crop variety
- Proper water management
- Weed control
- Use of the right type of fertiliser suitable to the soil and the crop
- Balanced application of the different fertiliser nutrients
- Application of other components in the nutrient package, such as organics, bio-fertilisers, micro nutrients etc.
- Using the right quantities of fertilisers as well as other sources of nutrients
- Manipulation of application techniques (method, time etc.)
    * Split application
    * Placement technique
    * Foliar application etc.
- Controlled release of fertilisers
    * Coating the fertilisers
    * Use of chemicals
    * Manipulating the particle size etc.
- Fertiliser application for the entire cropping system instead of for a single crop.

The out look for fertiliser
use in the years to come:

Today, the level of fertiliser consumption is universally regarded as an important index of agricultural progress. It is gratifying that in India, the level of fertiliser consumption has been steadily going up. From a meagre quantity of sixty six thousand tonnes of nutrients in 1950-51, fertiliser consumption has gone up to 6.1 million tonnes in 1981-82. The growth in fertiliser consumption over the last thirty years will be discussed in detail in Chapter.6.

India has committed herself firmly to the strategy of enhancing agricultural production through increased fertiliser use. The strategy has proved a sound one judged from the achievements in agricultural production registered by the country.[17]

However, any further break through in fertiliser use would depend upon a sound programme of agricultural research and an innovative programme of agricultural extension. The most essential requirement is to minimise the risks involved in employing the modern farm strategy. It is apparant that the modern farm strategy is not only investment intensive, but also risk intensive. When the risk of growing the crops is high, there is a tendancy to resort to a low cost and low effort system of farming. It is very essential to reduce the risk element if the level of fertiliser use is to be stopped up further. Factors affecting fertiliser use have changed in the past several years and are changing continuously. The agricultural strategy must provide for the existing realities and render farming and fertiliser use remunerative under existing conditions.

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17. Please see chapter 3, pp. 19 & 29

Fertiliser use could be stepped up considerably if the small and marginal farmers in the country are brought under the new farming strategy. This is admittedly a difficult job.

Similarly, fertiliser use in India could be stepped up considerably in the years to come if the dry farming systems in the country are persuaded and enabled to apply a reasonable level of fertilisers. This is as difficult a job as enabling the small and marginal farmers to use a fair amount of fertilisers. The future of fertiliser use in India will depend, in a significant manner, on the extent to which these difficult tasks are accomplished.

CHAPTER - 5

THE PROFILE OF THE INDIAN FERTILISER INDUSTRY

It was mentioned earlier that India is the fifth largest consumer of chemical fertilisers and the fourth largest producer of nitrogenous fertilisers in the world[1]. Evidently, the fertiliser industry of India is quite big by international standards. Apart from its bigness in terms of installed capacities of production, India's fertiliser industry is also characterised by a high degree of technological sophistication and a high intensity of investment. It is also, one of the fastest growing industries of India. In this Chapter it is attempted to provide an outline of the significant dimensions of the Indian fertiliser industry.

Brief history of the Indian fertiliser industry:

Indian Fertiliser Industry was born in 1906, when EID Parry & Co., entered the scene with the first fertiliser factory in India at Ranipet, Tamilnadu. The production was confined to single Superphosphate, (SSP) using powdered animal bones and Sulphuric Acid. The plant is still in operation though it has undergone some modification. The next to enter the scene was Dharamsi Morarji Chemical Company(DMCC). DMCC established a factory in 1924 at Ambarnath in Maharashtra State. This was followed by Delhi Cloth Mills (DCM) which put up a factory in 1946 at Delhi. These two factories also produced single Superphosphate.[2] And both of them are still in operation.

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1. Please see page.2, Chapter.1.

2. Chari, K.S. "Indian Fertiliser Industry" in Fertiliser industry - 1979, Bombay, 1979, pp.9-10

As regards nitrogenous fertilisers, Tata Iron and Steel Company (TISCO) at Jamshedpur was the first to enter the field. In 1933 TISCO produced Ammonium Sulphate as a bye-product from the coke oven plants attached to their steel plants. Mysore Chemicals and Fertilisers at Belagula near Mysore was the first unit in India to make synthetic ammonia and Ammonium Sulphate, as a straight product, though on a small scale. This was in 1941. The capacity was a mere 5 M.T.per day of Ammonium Sulphate. This unit was abandoned in 1965 as uneconomic and unviable.[3]

The Fertilisers And Chemicals, Travancore Limited, Alwaye (FACT) was the first large scale fertiliser unit in India. FACT went into production in 1947. It produced Ammonium Sulphate, using the wood gasification process for making Ammonia. This process was till then confined to the laboratory and was exploited for the first time in the world by FACT for commercial production. To start with, FACT had a capacity of 50,000 tonnes of Ammonium Sulphate, i.e. 10,000 tonnes of N.[4] The wood gasification process was replaced after some years by the electrolysis process and still later by the Oil gasification process using naphtha, as the feed stock. This plant is still in operation. FACT has undergone a series of expansions in the past thirty years. Today, it ranks among the top fertiliser units in the country.

These were the humble beginnings of an industry that was to grow into a giant in thirty years time.

Table - 1 in the next page gives the details of the growth of fertiliser production capacity in India, in a chronological order from 1933-34 to 1981-82. Till 1976-77, the capacities in selected years only are shown in the Table and from 1976-77 till 1981-82, year by year details are shown.

3. Ibid.

4. Ibid.

TABLE - 1.

Growth in fertiliser production capacity[5]

Year	Total installed capacity(cumulative) in '000 M.T. N	P
1933 - '34	5	31
1947 - '48	92	31
1951 - '52	182	129
1961 - '62	283	182
1965 - '66	571	188
1971 - '72	1487	532
1976 - '77	3072	1040
1977 - '78	3224	1042
1978 - '79	3299	1117
1979 - '80	3903	1284
1980 - '81)[6]	4586	1330
1981 - '82)	4735	1451

5 Ramanathan, K.V. and Rao, D.G. "Evolution of the fertiliser industry in India", in The Fertiliser Association of India(ed) Development of fertilisers in India, F.A.I. New Delhi. 1980. pp. 66, 79 & 80.

6. Figures in respect of 1980-81 and 1981-82 have been taken from Fertiliser News July 1982, The Fertiliser Association of India, New Delhi, p. 87.

It can be seen from the Table that the fertiliser capacity in India was merely 92,000 M.T. of N and 31,000 M.T. of P when India attained independence (1947).

It is the post independence era that gave a real impetus to the growth of the fertiliser industry in India. As agriculture and food production gained dominance in national planning, it was, but natural that the fertiliser industry started growing rapidly. The year 1951 saw the birth of a new fertiliser plant at Sindri in Bihar. Sindri Fertilisers which formed part of the later day Fertiliser Corporation of India was the first large unit to go into production in Independent India. The Sindri Fertilisers matched the contemporary international standards in size, technology and sophistication. This also underwent a series of changes and expansions. At the initial stages of operation at Sindri, the unit had used coke and coke oven gas as raw material and later supplemented it with naphtha. Sindri was an important milestone in the saga of fertiliser industry in India. Following Sindri, a string of fertiliser factories got established all over the country. The Nangal Fertiliser Plant went into production in 1961.

In January 1961, the Fertiliser Corporation of India Limited (FCI) was established to take over the management of Sindri and Nangal factories. The Corporation since then grew into a giant, managing a substantial proportion of the total fertiliser capacity in the country. But it was divided into five corporations in 1977 as part of a re-structuring policy.

Table - 1 reveals that during the ten year period between 1961 and 1971, the fertiliser industry of India underwent a very fast expansion. Capacity increased from a mere 283,000 M.T. of N to one and a half million M.T. of N. A dozen major units entered the scene. The existing units also underwent rapid expansion. FACT expanded its capacity as well as the range of products considerably. Neyveli was a major new entrant in the field in 1966 with a capacity of 70,000 M.T. of N per year in the form of Urea - based on gasification of lignite and as a part of an integrated lignite development complex. FCI/Trombay, FCI/Gorakpur, FCI/Namrup, Hindustan Steel Ltd. (HSL)/Rourkela, EID Parry Ltd./Ennore, Gujarat State Fertiliser Co. Ltd.(GSFC)/Baroda, Coromandel Fertilisers Ltd. (CFL)/Vizag, Indian Explosives Ltd. (IEL)/Kanpur and Shriram Chemical Industries (SCI)/Kota went into production during this decade.

Between 1970 and 1980 the fertiliser capacity further increased. FACT/Alwaye, SCI/Kota, CFL/Vizag, FCI/Gorakpur and FCI/Namrup expanded their capacity. A few more new units - Madras Fertilisers Ltd. (MFL)., Zuari Agro Chemicals (ZACL) Goa, FACT-Cochin Phase I and Phase II, FCI/Durgapur, Indian Farmers Fertiliser Cooperative Ltd. (IFFCO)/Kalol and Kandla, Southern Petro-Chemical Industries Corporation Ltd. (SPIC)/Tuticorin, Mangalore Chemicals and Fertilisers Ltd. (MCF), FCI/Barauni, FCI/Durgapur and FCI/Namrup went into production.

By 1980, the installed capacity of the Indian fertiliser industry had reached 4 million M.T. of N and 1.3 million M.T. of P. (See Table - 9.)

The present position of the
Indian Fertiliser Industry:

At present, i.e., during 1981-82 there are 31 major fertiliser plants producing nitrogenous and complex fertilisers, six plants producing Ammonium sulphate as a by-product, three TSP plants and 40 SSP plants (including 10 units in the small scale sector) operating in the country.[7]

As on 1-10-1981, the installed production capacities of fertiliser in India stands at 4.74 million M.T. of Nitrogen (N) and 1.45 million M.T. of Phosphate (P) in terms of P_2O_5 (see Table - 2) In addition to the above mentioned capacities which is already in production, a capacity of 2 million M.T. of N and 0.16 million M.T. of P is under construction but not ready, yet for production. The details of capacities that are currently in production capacities under implementation, capacities that are approved in principle and those that are under consideration are furnished in a nutshell in Table-2.

7. Fertiliser News - July 1982; op.cit; p.82

TABLE - 2

Fertiliser production capacities as on 1-10-1981 [&]

		Capacity (in'000 M.T.)	
		N	P
I.	Factories in production	4736	1450
II.	Under implementation	1973	164
III.	Approved in principle	813	516
IV.	Under consideration	2120	590
	Grand Total	9642	2720

A map indicating the location of each of the fertiliser factories in India - those already in production, under implementation, approved but not yet taken up, and those under consideration is shown in Appendix IV in page 382

The Product-Mix

The fertiliser industry of India produces a wide range of fertiliser products. The installed capacity of 4.74 million M.T. of N and 1.45 million M.T. of P, making up a total of 6.19 million M.T. in terms of nutrients (Please see Table - 2) as on 1-10-1981, will work out to nearly 16 million M.T. of various fertiliser products.

Urea is the most popular, most extensively used and most extensively produced fertiliser in India. It has a nutrient content of 46% N. It accounted for 79 percent of the Nitrogen produced in the country in 1981-82. The quantity of urea produced during the year was 5.38 million M.T.

& The Fertiliser Association of India; Fertiliser Statistics 1980-81, New Delhi, 1981, p. I-243.

Table-4 in the next chapter (page) gives the details of actual production of each type of fertiliser during 1981-82. It will give an indication of the relative importance of the different fertilisers in the total product mix of the fertiliser industry.

Single Superphosphate (SSP) is the oldest chemical fertiliser. It involves a relatively low technology, small sized plants and relatively low investment. Its nutrient content (16% P) is also the lowest among all chemical fertilisers. The production of SSP in 1981-82 in India was 1.2 million M.T.

Triple Superphosphate (TSP) is another straight phosphatic fertiliser like SSP but has a much higher content of P(46%). There are only three units producing TSP at present in India. The quantity of TSP produced in 1981-82 was 48,000 M.T.

D.A.P. is the most concentrated or the highest analysing complex fertiliser manufactured in India. It carries 18% of N and 46% of P. The quantity of DAP manufactured in India in 1981-82 was 278000 M.T.

As regards the other N.P. and NPK complexes, there is a large variety of grades. It may not be quite appropriate to club all of them together. Yet, it would be worthwhile to mention that the production of all varieties of NP and NPK complexes in India totalled up to 2.78 million M.T. in 1981-82.

As regards Potassic fertilisers, the needs of the country are met entirely through imports.

Investment profile:

Earlier it was mentioned that the fertiliser industry is characterised by a high intensity of investment. To be precise, as on 1-11-1981, the total financial outlay in the fertiliser industry of India stood at Rs.5247 crores. Out of this amount, the investment in the units already in production works out to Rs.3066 crores and the balance is invested in the units under implementation. In addition to this, an investment of Rs.788 crores has been committed to the units which have been approved in principle.[9]

Not only the overall investment in the industry is of a high order, but the investment in each individual unit in the industry is also quite sizeable. The latest units like Hazira and Thal-vaishet, under construction will have more than Rs.1000 crores investment each when completed.

Ownership pattern in the fertiliser industry

The impact of the mixed economy adopted by India is fully seen in the Indian fertiliser industry. Though, fertiliser belongs to the core sector of Indian industry, the fertiliser units are widely distributed over the public and private sectors. There is also sizable fertiliser

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9. Fertiliser Statistics . 1980-81, op.cit; p.I-243

capacity in the cooperative sector.

It can be seen ~~from the data presented in Appendix-III~~ that as regards the units that are already under production, 60% of the capacity in respect of N is in the Public Sector, 30% in the private sector and 10% in the cooperative sector. In respect of P, the private sector has a dominant role. 46% of the total capacity of P under production is in the private sector; 38% is in the public sector; and 16% in the cooperative sector. As regards the projects under implementation, in the case of N, more than 50% is in the public sector, 14% in the private sector and 35% in the cooperative sector. In the case of P, 73% is in the public sector and 27% in the private sector.[10]

Technology profile:

The fertiliser industry of India presents a kaleidoscopic variety in the technology and process employed as well as in the size and age of the units. Units varying from the smallest to the largest size, units of varying vintages, units using all possible feed stocks and units using a variety of technologies are simultaneously in operation in India.

Catching up with latest technology:

Fertiliser is one of those industries where the economics of scale is constantly being pushed upwards. **With the advent of every new** technology, units that were considered as giants

10. For details, please see Appendix V, p.383

a few years earlier, come to be classified as old generation units

Luckily, India has been

catching up fast with the rapidly changing technological developments in the fertiliser field. The latest units under implementation in India are on par with the best in the world in size and technological sophistication. As S.K. Mukherjee points out,

> "The growth in size and technology have taken the industry to a level where it can hold its own with the best in the world. The eyes of the world fertiliser industry are constantly and continuously reviewing developments in every aspect of the industry in India. The international agencies concerned with the development of agriculture and chemical fertilisers constantly refer to India's progress in this vital field. These are matters of satisfaction to all of us connected with the industry"[11]

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11. Mukherjee, Dr. S.K; "Technological developments in India's fertiliser industry" in <u>Development of fertilisers in India</u>, <u>op.cit</u>; p.111

CHAPTER - 6

REVIEW OF PRODUCTION, CONSUMPTION AND IMPORTS OF FERTILISERS IN INDIA

In Chapter 5, the profile of the fertiliser industry of India and its history from its beginning till date was reviewed in some detail. In this chapter the performance of the country so far in the matter of production, consumption and imports of fertilisers will be examined. Efforts will also be made to assess the present position and what the future holds out in each of these areas.

PRODUCTION OF FERTILISERS

Table 1. gives the details of the growth in production of fertilisers in India since 1951-52. The growth is indicated over time intervals of ten years.

TABLE - 1

Growth in production of fertilisers in India[1]

Year	Production in '000 M.T.		
	N	P	N + P
1951 - 52	29	10	39
1961 - 62	154	65	219
1971 - 72	949	290	1239
1981 - 82	3143	950	4093

The data presented in Table 1 reveals that from the very low level of 29,000 M.T. of N and 10,000 M.T. of P in 1951-52, the fertiliser production in India has increased to 3.14 million M.T. of N and 0.95 million M.T. of P in 1981-82. The data also reveals that the

1. Fertiliser Statistics 1980-81, The Fertiliser Association of India, New Delhi, 1981, p.I-178. The figures in respect of 1981-82 have been taken from Fertiliser News July, 1982, The Fertiliser Association of India, New Delhi, 1982. p.86

sixties was a decade of great development in fertiliser production. During that period the production of nitrogenous fertilisers grew more than six fold and that of phosphatic fertilisers nearly five fold. The seventies also was a decade of impressive growth in fertiliser production but the compound rate of growth during the seventies was not as good as that of the sixties. This was partly because the base had become much larger and the same high rate of growth on such a larger base could not be sustained. In absolute terms, however, the growth in seventies also was quite remarkable.

Production in recent years:

Table 2 below gives year by year production of fertilisers between 1971-72 and 1981-82.

TABLE - 2

Year by year production of fertilisers-1971-72 to 1981-82[2]

Year	Production in '000 M.T. of nutrients		
	N	P	N + P
1971-72	949	290	1239
1972-73	1055	330	1385
1973-74	1050	325	1375
1974-75	1187	331	1518
1975-76	1508	320	1528
1976-77	1862	478	2340
1977-78	2000	670	2670
1978-79	2173	778	2951
1979-80	2224	763	2987
1980-81	2164	841	3005
1981-82	3143	950	4093

2. Same as 1. in page 73

It can be seen from Table-2 that production of nitrogenous fertilisers got doubled between 1971-72 and 1976-77, in five years' time. The next two years i.e. 1977-78 and 1978-79 also witnessed appreciable growth in production. In 1977-78, production of nitrogenous fertilisers in India crossed the one million tonnes mark for the first time. A more detailed analysis of the production in recent years is provided in the succeeding paragraphs.

Production in 1979-80

Domestic production of fertilisers in 1979-80 amounted to 2.22 million M.T. of N and 0.76 million M.T. of P, making a total of 2.98 million M.T. of nutrients. This was against the installed capacity of 3.9 million M.T. of N and 1.3 million M.T. of P, totalling 5.2 million M.T. of nutrients. This meant that the capacity utilisation in 1979-80 came down to 63 percent in the case of N and 68 percent in the case of P from the level of 69 percent and 71 percent respectively, of 1978-79.[3]

The increase in production in 1979-80 over 1978-79 was only marginal - an increase of half a lakh tonnes of N or a mere 2.3 percent increase. In the case of P, there was actually a drop of 15,000 M.T. or 1.9 percent as compared with 1978-79. The gravity of this poor production performance will be evident when we reckon the addition of a fresh capacity of 6 lakh M.T. of N during the year. Inspite of addition of a fresh capacity of 6 lakh M.T. to the capacity, the production increased only by half a lakh M.T.

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3. For details, please see Appendix VI , page 384 .

It is not, perhaps, inapt to describe 1979-80 as an unhappy year for fertiliser production. As a matter of fact, it was an year of set back and stagnation for industrial production in general. The infra-structure sector, especially power sector performed poorly during the year. As regards the fertiliser industry, the new units could not stabilise the production. Some of them could not even get going with the 'commissioning'. A few of the functioning units also performed poorly during the year.

Production in 1980-81:

If production in 1979-80 was bad, production in 1980-81 was worse. Production of Nitrogen in 1980-81 totalled up to only 2.20 million M.T. This was far short of the target of 2.75 million M.T. which itself was modest. Furthermore, production in 80-81 was less than that of 79-80 even though there was an addition of new capacity in 80-81 of nearly 1½ million M.T. over what was available in 79-80.

Production of P was however not bad, compared with the targets. It totalled up 0.84 million M.T. compared with the target of 0.85 million M.T. and 0.76 million M.T. actually produced in the previous year.

In terms of capacity utilisation, again, the performance in 1980-81 was very poor in respect of N and reasonable in respect of P. Compared with the utilisation rate of 63% in 1979-80, the utilisation rate in 1980-81 in respect of N was only 53%, a decline of 10%. In respect of P the rate of utilisation was stationary at 65%.

Production in 1981-82

Production in 1981-82 was a refreshing contrast from the stagnant position of 1979-80 and 1980-81. Whereas 1979-80 witnessed a meagre rate of growth and 1980-81 a negative rate of growth, there was substantial growth in production in 1981-82. Production of N in 1981-82 reached the all time high of 3.14 million M.T. registering an increase of one million M.T. in a single year. The percentage increase in N worked out to 45.2 In the case of P also, the production was an all time high at 0.95 million M.T. registering an increase of 0.11 million M.T. over the production of 0.84 million M.T. achieved in the previous year. The percentage increase in production of P in 1981-82 over that of 1980-81 worked out to 13.0.

Poor utilisation of the production capacity:

Poor capacity utilisation has been a perennial problem with the fertiliser industry in India. This, coupled with the unduly long gestation period of the fertiliser projects has kept the actual production of fertilisers far short of the licensed capacity at any given point of time. Over the years, the capacity utilisation in the fertiliser industry has oscillated between 50% and 65%. The lowest percentage capacity utilisation in recent years was 53% in N in 1980-81 and 45% in P in 1975-76. The highest was 69% in N and 71% in P ~~both~~ in 1978-79.

Appendix VI in page 384 gives year by year details of installed capacity, actual production and percentage of capacity utilisation - separately for N and P between 1973-74 and 1981-82.

The constraints that inhibit the fuller utilisation of the established capacities of production in the fertiliser industry in India are many and varied. To quote two experts in the field,

> "Though the capacity built up in this country over the years has been spectacular, the actual outputs realised have been poor by international standards. A variety of reasons has contributed to inadequate capacity utilisation in the plants. More important among these are technical limitations or mechanical break downs in the plants, quality or quantity short comings of feedstock, failure to make timely provision of inputs like fuel, power and feedstock, and the time taken by personnel to develop the necessary degree of skill to run and maintain plants based on modern technology".[4]

An exhaustive list of constraints that inhibit a better utilisation of the installed production capacities in fertilisers is given below:

- Some of the units are very old. They are not amenable to for high rate of capacity utilisation.
- Some of the units are brand new. They suffer from many teething troubles that are inherent in the fertiliser industry.

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4. Ramanathan K.V. and Rao D.G., "Evolution of the fertiliser industry in India - A historical review" in <u>Development of Fertilisers in India</u>. The Fertiliser Association of India, New Delhi, 1980.p.76

- Some of the units suffer from special technological problems due to the process or the type of feed stock chosen by them.
- Some of the units have gone in for unproven equipments and suffer from frequent failures of critical equipments.
- Inefficient operation and maintenance of the plants
- Power problem - power cuts, power failures and voltage instability.
- Shortage of coal - non-availability of coal or the bottle necks in transporting the available coal.
- Shortage of feedstock like naphtha, gas or fuel oil.
- Shortage of raw materials other than feed stock, like rock phosphate and sulphur and imported phosphoric acid.
- Labour problems and disturbed conditions in some parts of the country.
- Overall unfavourable environment in which some of the units operate.

Unit to unit variations in capacity utilisation:

Apart from the low capacity utilisation in general, there are wide variations in capacity utilisation among the various fertiliser units in India. Some of the units have a very creditable record in capacity utilisation and compare very well with similar units in the most advanced countries. But, a good number of units are below 70% level in capacity utilisation.

The short fall in production arising out of such poor performance is proving extremely costly to the nation, because the nation is left with no alternative but to make good the short fall by imports at a prohibitive cost. This aspect has been dealt with in some detail in the discussion on 'imports'. (please see pp. 108 - 111)

Zone wise and statewise
<u>production of fertilisers</u>:

The production of fertilisers in India is not uniformly spread over the different regions and states in the country. There is a good concentration of fertiliser producing units in some states and zones. The reasons are mainly techno-economic. Taking the recent years into consideration it can be seen that the South Zone and West Zone dominate the fertiliser production scene in the country. Table 3 below gives the details for 1980-81 and 1981-82.

TABLE - 3

Zonewise production of fertilisers (in '000 M.T.)[5]

	N				P			
	1980-81		1981-82		1980-81		1981-82	
	Production	% share of the zone	Production	% share of the zone	Production	% share of the zone	Production	% share of the zone
Central	326	15.1	588	18.7	63	7.6	68	7.2
East	187	8.6	470	14.9	34	4.1	36	3.8
North	291	13.4	486	15.5	2	0.2	6	0.6
South	779	36.1	829	26.4	350	41.6	361	38.0
West	581	26.8	770	24.5	391	46.5	479	50.4
All India	2164	100.0	3143	100.0	841	100.0	950	100.0

5. Fertiliser News - July 1982, Op.cit., P.87

It can be seen from Table 3 that the South and West zones together account for more than 50%of the total production of nitrogenous fertiliser in the country and nearly 80% of the total phosphatic fertiliser production, while the other three zones viz. North, central and East together account for only less than 50% of the total production of N and 20% of the total production of P. The very high concentration of production of P in the South and West is mainly due to the fact that the phosphatic fertiliser units are mostly port based. They cluster around the peninsular part of the country. The reason for such port based locations of phosphatic fertiliser units is that the two main raw materials needed by the phosphatic units viz. phosphate rock and sulphur are, mostly imported into India from outside. Such concentration of fertiliser production in some parts of the country has several marketing implications, important among them being those related to transportation, warehousing and physical distribution. Some of these implications will be examined in the relevant chapters that follow.[6]

The statewise position of fertiliser production has been furnished in Appendix 2. The wide variations in production from state to state will be evident from the data presented in Appendix.[7]

Forms in which fertilisers are produced in India.

The foregoing paragraphs have explained the position of fertiliser production in terms of the nutrients - N and P. It is necessary to have an idea as to the forms in which the country produces the fertilisers. Urea is the most widely produced fertiliser in India. As much as 80% of the total straight nitrogenous fertiliser production in the country is in the form of Urea. In quantitative terms, the production of Urea in 1981-82 in the

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6. Please refer chapter 9 & 10.

7. Please see Appendix-VII , page 385 .

country amounted to 5.4 million M.T. The main forms in which fertilisers are produced in India and the quantities of each of these major fertilisers produced in 1981-82 are given in Table 4.

TABLE - 4.

Product wise production of fertilisers [8]
1981 - 82

Material	Production in ('000 M.T.)
Urea	5382
Ammonium Sulphate	443
C.A.N.	404
S.S.P.	1207
T.S.P	215
D.A.P	278
Various N.P. and N.P.K. complex grades put together	2588
	10517

CONSUMPTION OF FERTILISERS:

Consistent with the growth in production described above there has been a big growth in fertiliser consumption in India during the last thirty years. In fact, the consumption has all along been far in excess of the production and the country has been importing large quantities of fertilisers to bridge the gap between consumption and domestic production.

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8. For more details and source please see Appendix VIII page 386.

TABLE-5.

Growth in consumption of fertilisers in India [9]
1951 -'52 to 1981-'82

('000 M.T.)

Year	N	P	K	N+P+K	Growth rate (%) over the previous year N + P + K
1951-52	59	7	Negligible	66	-
1956-57	108	13	10	131	-
1961-62	250	61	28	339	-
1965-66	575	133	77	785	-
1966-67	738	249	114	1101	40.3
1967-68	1035	335	170	1540	39.9
1968-69	1209	382	170	1761	14.4
1969-70	1356	416	210	1982	12.5
1970-71	1479	541	236	2256	13.6
1971-72	1798	558	300	2656	17.7
1972-73	1839	581	348	2768	4.3
1973-74	1830	650	360	2840	2.5
1974-75	1766	472	336	2574	- 9.4
1975-76	2149	468	278	2894	12.5
1976-77	2457	635	319	3411	17.9
1977-78	2913	867	506	4286	25.7
1978-79	3420	1106	592	5118	19.4
1979-80	3499	1150	607	5256	2.7
* ◊ 1980-81	3678	1214	624	5516	4.9
◊ 1981-82	4069	1322	676	6067	10.0

The data presented in Table.5 reveals that fertiliser consumption

9. Fertiliser Statistics 1980-81, Op.cit, pp.I-178 - I-180.

*Fertiliser News, July 1982. Op.cit, P.76

in India increased from 66,000 M.T. to 6.1 million M.T. over a period of thirty years - from 1951-52 to 1981-82. Fertiliser consumption in 1961-62 was twenty times that in 1951-52; consumption in 1971-72 was forty times that in 1951-52. Consumption in 1981-82 was ninety two times that in 1951-52.

Chequered growth in
<u>fertiliser consumption:</u>

Detailed analysis however shows that fertiliser consumption in India has had a chequered history. In some years the growth has been spectacular, in others moderate and in yet others meagre. A couple of years have even witnessed negative rate of growth.

The country took fifteen years from 1951-52 to achieve the first million M.T. in fertiliser consumption. But the second million was achieved in just four years. It took another six years for the country to cross the three million mark. The fourth million M.T. of consumption was achieved in the very next year; so also the fifth million. But it took three more years to achieve the next million M.T.

The uneven rate of growth will also be evident by looking at the growth rates in the best and the worst years. The growth rate in the best year i.e. 1966-67 was + 40.3%. The growth rate in the worst year i.e. 1974-75 was negative at —9.4%. In recent years too, the consumption has varied widely between 25.7% in 1977-78 and 2.7% in 1979-80.

Such year to year variations in the growth of fertiliser consumption is quite disturbing. It may perhaps be misleading to draw conclusions regarding the progress of fertiliser consumption solely based on the year to year variations. It may be difficult to correctly discern the pattern of fertiliser consumption by looking at even two consecutive years in isolation. One may have to look at the average performance over much longer periods, say, over time intervals of five years, to discern the true patterns of consumption and trends of growth. An exercise of this kind has been done and the patterns furnished in Table 5-A in the next page. The table shows the actual consumption during the chosen years at intervals of five, over a time span of 30 years from 1951-52 to 1981-82. It also shows the exponential growth rate during each of the five year time intervals.

It can be seen from the Table that the exponential growth rates in respect of N + P + K over the five year time intervals have varied from 5.2% to 26.6% confirming the chequered growth in fertiliser consumption in India. The fifteen year period commencing from 1966-67 has especially witnessed a wavy, undulating pattern of consumption. The five year interval between 1961-62 and 1966-67 witnessed the highest exponential growth rate of 26.6%. In the next five year interval, the growth rate went down to 19.2%. In the next five year interval there was a total slump, the growth rate sliding down to 5.2%. In the last five year interval i.e. between 1976-77 and 1981-82, there was a resurgence, the exponential growth rate becoming double that of the previous five year interval.

TABLE - 5-A

Five yearly exponential growth rate of fertiliser consumption
1951-52 to 1981-82 /O

N + P + K

Year	Consumption in '000 M.T.	Exponential rate of growth over the previous five years (%)
1951 - 52	66	-
1956 - 57	131	14.7
1961 - 62	339	21.0
1966 - 67	1101	26.6
1971 - 72	2656	19.2
1976 - 77	3411	5.2
1981 - 82	6067	12.2

/O Derived from Table 5 in page

Major break through in fertiliser consumption in mid-sixties.

The real break through in fertiliser consumption in India came in 1966-67. From Table 5, it can be seen that during 1966-67, fertiliser consumption in India reached 1.1 million M.T. of nutrients, registering the highest annual growth rate of 40.3%. Earlier, In the chapter on Indian agriculture, it was noted that the year 1966-67 heralded India's green revolution.[11] It was also mentioned that, from that year an up-surge took place in Indian agriculture through the combined effect of high yielding crop varieties and massive use of chemical fertilisers. The covariance of increased adoption of high yielding crop varieties,increased use of chemical fertilisers and increased food production between 1966-67 and 1978-79 (year by year) was also illustrated in Table-3 of that chapter.[12]

Table-5 in the present chapter will show that in 1966-67, a very significant increase in fertiliser consumption - an increase of 316000 M.T. of nutrients over the previous year was registered. The rate of growth in that single year was 40.3%. Table-5 also reveals that the five year interval commencing from 1966-67, was the most significant period for fertiliser consumption in India. By the end of this five year period, i.e. by 1971-72 consumption had gone up to nearly 2.7 million M.T. of N+P+K, an exponential annual growth rate of 19.2% during the five years.

11. Please see chapter-3, pp. 20-27

12. Ibid; p.25

No doubt, in the previous five year interval, the exponential growth rate was still better at 26.6%. But the quantum increase in consumption in those five years was not as appreciable as in the five year period between 1966-67 and 1971-72. This was so because the growth in the previous interval was on a relatively smaller base, whereas the growth in the latter interval was on a relatively larger base. In terms of quantum increase, the growth in the last five year interval between 1976-77 and 1981-82 was the best. But in terms of exponential growth rate, it could take only the last but one place in the six time intervals shown in the table . This means that when both the aspects i.e. quantum increase and the growth rates are together taken into account, the five year period 1966-67 to 1971-72 has been the best period for fertiliser Consumption in India. Neither before, nor afterwards, fertiliser consumption prospered as much as it did during those five years. For food grains production too, this five year period was the best, as could be seen from the chapter on Indian agriculture.

Downward trend in consumption -
<u>1972-73 to 1974-75:</u>

The spectacular increase in fertiliser consumption registered in the year 1966-67 and the five years that followed received a set back during the period 1972-73 to 1974-75. The growth rate slumped to 4.3% in 1972-73. In 1973-74, it became worse, dropping to 2.5%. In 1974-75, fertiliser consumption in India received the worst set back. During that year, fertiliser consumption, registered, for the first time after 1960-61, a negative growth. The drop was as steep as 9.4%. During the next two years also, fertiliser consumption was unsatisfactory, though it was not as bad as in 1974-75. A variety of factors were responsible for the slump in consumption in this three year period.

In the first place, availability of fertilisers itself became a limiting factor. The period of surplus availability through liberal imports came to a close by the end of 1971-72. World fertiliser market became very tight. The surplus countries had only limited stocks for exports. Secondly, the international prices were showing an uptrend. Domestic production in India continued to be far short of requirements. The shortage situation brought in its turn, governmental controls and restrictions on distribution. On top of this, the sharp escalation in fertiliser prices in the international market as a result of the world energy crisis triggered over a near doubling of fertiliser prices in India during June, 1974. Besides, a credit squeeze was also imposed. 1974-75 also witnessed an unfavourable weather situation. The combined effect of all these factors was a reversal of the fourteen year long trend of rising consumption. As mentioned earlier, 1974-75 saw a drop in consumption of 9.4 percent compared to the previous year. The drop occurred in all the nutrients, the highest being in the case of P_2O_5 at 27.5 percent.

Recovery of consumption trends in 1975-76 & 76-77:

The Government and the fertiliser industry took certain steps to arrest the deterlorating trend. Realising that the high price of fertiliser continued to inhibit fertiliser consumption, the Government of India reduced fertiliser prices twice during the second half of 1975. The industry and the government agencies intensified the promotional efforts. Still, the position was that the bad trend got reversed in 1975-76 only in respect of N and not in respect of P and K. This was mainly due to the fact that the unit prices of P and K were abnormally high compared to unit price of N. The government tookafew major remedial measures through the price mechanism and through the introduction of subsidies and an adjustment in the excise duties. As a combined result of all these measures, there was a resurgence in fertiliser consumption in1976-77, compared with the slump of 1972-73 to 1974-75 and the feeble recovery of 1975-76. Consumption during 1976-77 grew by 18% over that of 1975-76.

High growth rates in 1977-78 and 1978-79.

The resurgence in 1976-77 was maintained during the next two years i.e. 1977-78 and 1978-79. The rate of growth in consumption during these two years over the immediately preceding years were 25.7% and 19.4% respectively. During 1978-79, for the first time, the annual fertiliser consumption in India exceeded the 5 million M.T. mark. The actual consumption was 5.14 million M.T. of nutrients. And this was more than double that of 1974-75. In other words, within four years between 1974-75 and 1978-79, fertiliser consumption got doubled.

Re-emergence of downward trends in
1979-80, 1980-81 and 1981-82

1979-80 as well as 1980-81 were bad years for fertiliser consumption in India. The wave like pattern in fertiliser consumption was confirmed by the trends in these two years. Having reached an annual average growth rate of 25% during the four year period between 1975-76 to 1978-79, the growth rate slumped to nearly one tenth of it in 1979-80. The rate of growth in that year over 1978-79 was very meagre - 2.3% in N, 4% in P, 2.5% in K and overall 2.7%. The good going of four consecutive years, 1975-76 to 1978-79 was reversed. The performance of 1979-80 was poor even when the entire decade of 1970's is taken for comparison. The growth rate of 2.7% of 1979-80 compared very poorly with the average annual compound growth rate of 10.8% of the previous nine years.

1980-81 was also not a happy year for fertiliser consumption. Against a targetted growth rate of 18% the achievement was only 5.5%. In absolute terms, the target of consumption for 1980-81 was 6.1 million M.T., the achievement was 5.57 million M.T. Hopes of major resurgence in fertiliser consumption in 1980-81 were belied. The only consolation was that the growth rate in that year (5.5%) was better than that of the previous year (2.7%). But the previous year being a drought year, the consumption was very low. Viewed against that reality, the growth of fertiliser consumption has not shown a satisfactory trend in 1980-81.

In 1981-82, fertiliser consumption showed a discouraging trend for the third year in a row. There was no decline in consumption as compared with the previous year, but the rate of growth was unsatisfactory. A target of 6.7 million M.T of consumption was fixed for 1981-82. This represented a growth rate of 22% over 1980-81. Actual achievement was however less than 6.1 million M.T. representing a growth rate of only 10%.

Fertiliser consumption
reaching a plateau:

The unsatisfactory growth in fertiliser consumption in 1979-80, 1980-81 and 1981-82 in a row, is indeed very disturbing. In 1979-80 there was a severe drought in the country and the slump in fertiliser consumption could be attributed to a good measure to the poor weather conditions. But, 1980-81 and 1981-82 were very different from 1979-80 as far as weather conditions were concerned. There were two steep price revisions - one each in 1980-81 and 1981-82. The details of these two revisions have been furnished in the chapter on fertiliser pricing. The high prices of fertilisers has been cited as the main reason for the poor growth rate in fertiliser consumption in these two years. At the time of submission of this thesis, (1982) fertiliser consumption has not shown any healthy recovery. In fact, there is a glut in the fertiliser business.

It is essential to investigate objectively whether the high prices of fertilisers is the main reason for the slump in fertiliser consumption. No serious attempt seems to have been made to assess the extent of price elasticity of demand in respect of fertilisers. No one seems to know precisely the extent of impact of the price level of fertilisers on the growth rates of fertiliser consumption. This is an important area to be studied in depth.

still there does not seem to be reason to doubt that the high level of fertiliser prices is a factor that inhibits fertiliser offtake. It is quite possible that there are other inhibiting factors in the Indian agricultural front which are more disturbing than the fertiliser price factor. Perhaps, the country has reached a plateau in the technological revolution on the farm front. The impressive technological breakthrough achieved in the second half of the 1960's and sustained in the seventies, may be grinding to a halt, leading to a slowing down in the consumption of fertilisers. We have already noted that in recent years there has been no major breakthrough in farm production.[13] In the present chapter, we have also seen that in recent years there is no appreciable growth in fertiliser consumption. The two factors seen togöther may enable to reach a prima facie conclusion that a plateau has been reached in fertiliser consumption corresponding with the plateau reached in the technological break-through in the farm front. It will require more detailed analysis to arrive at a definite conclusion regarding these.

Regional spread of fertiliser consumption

Table 6 below presents zone-wise consumption of fertilisers in India. Appendix X. presents statewise consumption of fertilisers.[15]

TABLE - 6

Zone-wise consumption of NPK - 1981-82 (in '000 M.T.)[14]

Zone	N	P	K	N + P + K
Central	1209	329	115	1653
East	385	113	67	566
North	810	257	47	1113
South	1030	360	271	1660
West	571	234	129	935
Others	64	29	48	141
All India	4069	1322	676	6067

13 Please refer chapter 3, page 19 and 29
14 Fertiliser News, July 1982, op.cit., pp 108-117
15 For details please see Appendix X, page 387

It can be seen from Table-5 that there are wide variations in consumption among the different Zones. The variations are even more pronounced when the consumption is analysed state by state. These aspects are discussed in detail under the discussion on "Major weaknesses in the pattern of fertilisers consumption."

Seasonal Spread of fertiliser consumption:

The all India pattern of season wise consumption of fertilisers is ~~as follows:~~

TABLE-7 [16]

Year		Consumption ('000 M.T.) Kharif	Rabi
	N		
1978-79		1285	2135
1979-80		1359	2139
1980-81		1444	2234
1981-82		1561	2508
	P		
1978-79		391	715
1979-80		424	727
1980-81		422	791
1981-82		471	852
	K		
1978-79		256	336
1979-80		276	331
1980-81		272	352
1981-82		278	398
	N + P + K		
1978-79		1831	3186
1979-80		2059	3197
1980-81		2138	3378
1981-82		2310	3757

16 Fertiliser News, July 1982, Op.cit., pp 107 - 118.

It can be seen from the above figures that the Kharif season accounts for 35 to 40% of the total fertiliser consumption in India and the Rabi season accounts for 60 to 65%. A 40:60 share between Kharif and Rabi can be taken as the broad pattern of fertiliser consumption in India.

Table 7 also reveals that the pattern of seasonwise consumption varies from nutrient to nutrient. A broad pattern of 40:60 between Kharif and Rabi will apply only to the overall consumption of N + P + K and not necessarily to the individual nutrients. Similarly, the pattern applies only when the entire country is considered and not when the individual zones in the country are considered. This will be evident from Table 8 given below:-

TABLE- 8

Zone wise share of consumption over Kharif and Rabi seasons [17]

Zone	Ratio of consumption Kharif : Rabi 1980-81	Ratio of consumption Kharif : Rabi 1981-82
Central	30:70	32:68
East	33:67	36:64
North	32:68	31:69
South	44:56	39:61
West	54:46	54:46
All India	39:61	38:62

17. Ibid, p.106

It can be seen from Table-8 that whereas the central zone shows 30:70 share of consumption between Kharif and Rabi; the West zone shows a share of 54:46. It is evident that the Zonal pattern varies widely from the national pattern of 40:60.

The true picture about the extent of seasonality of fertiliser consumption in India will become more evident when a state by state analysis is made. In the All India pattern and the zone wise pattern, the seasonality is not seen so vividly. The state by state position of seasonwise fertiliser consumption has been shown in Appendix IX, p. 387

Major weaknesses in the pattern of <u>fertiliser consumption:</u>

At the beginning of this section it was mentioned that fertiliser consumption in India has had a chequered history. Over a period of thirty years, the growth has been uneven showing a wavy, undulating pattern. In addition to this unevenness in growth, there are several other weaknesses in the pattern of fertiliser consumption in India. The major ones are:-

(i) An extremely low level of consumption per unit of cropped area;

(ii) unevenness in consumption among the various regions and districts in the country;

(iii) unevenness in consumption by the different crops; and

(iv) unevenness in consumption of the three main nutrients, N, P & K.

Low level of fertiliser
consumption per unit of cropped area

While in absolute terms i.e. in total quantities of fertilisers consumed, India stands fourth among all countries of the world, in consumption of fertilisers per unit of cropped area, India compares very poorly with other countries.

The position of India in relation to some of the high fertiliser consuming countries of the world in 1979-80 has been as follows:

TABLE - 9

Comparative position of India in fertiliser consumption per unit of cropped area [18]

Country	1979-80 Consumption/ha of arable land (N + P + K in Kg.)
Netherlands	805
Japan	478
West Germany	479
Republic of Korea	384
France	312
U.K.	324
Egypt	212
U.S.A.	111
China	129
U.S.S.R.	75
India	30
World average	77

18. Fertiliser Year Book, Volume 30, FAO Rome cited by Fertiliser Statistics 1981-82., op.cit., p.III.35.

It is evident that the level of fertiliser consumption in India is very much below the world average. The fact that India is the fourth largest consumer of fertilisers in the world in absolute terms, loses its significance when it is reckoned that on per hectare basis, India is not even consuming half that of the world average. In fact, India is at the bottom of the table in this respect.

There is fortunately, a trend towards higher per hectare fertiliser consumption in India though the acceleration is not rapid enough. Table-10 provides the details of the gradual improvement in fertiliser consumption per unit of cropped area.

TABLE - 10

Fertiliser consumption per unit of cropped area - 1965-66 to 1981-82 [19]

Year	Consumption (kg./hectare)			
	N	P	K	N + P + K
* (1965-66	3.7	0.8	0.5	5.0
(1970-71	8.9	3.3	1.4	13.6
(1975-76	12.6	2.7	1.6	16.9
1978-79	19.9	6.4	3.4	29.7
1979-80	20.3	6.7	3.5	30.5
1980-81	21.3	7.0	3.6	31.9
1981-82	23.2	7.5	3.9	34.6

19. Fertiliser News. July 1982, Op.cit., p.141

* Fertiliser statistics 1980-81. Op.cit., p.I.92

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Uneveness in fertiliser consumption among the different zones and states in the country:

An examination of statewise levels of fertiliser consumption in India will indicate the wide variations in fertiliser consumption in different zones and in the different states in the country. The latest statistics in this regard are furnished in Appendix IX, p. 387.

The figures in Appendix IX show that five states - A.P., Maharashtra Punjab, U.P. and Tamilnadu - out of the total of 22 states and Union territories in India, account for nearly 60% of all fertilisers consumed in the country. From a deeper analysis it can be seen that the wide variations noticed in the consumption levels among zones and states are not necessarily due to differences in size or extent of cropped area of the different zones/ states. For, even after converting the consumption figures on a comparable basis i.e. on a per hectare basis, very wide variations are seen:

TABLE - 11

State wise consumption of fertilisers per unit of cropped area [20]

1981 - 1982

State	Consumption of N + P + K (Kg./ha)
Punjab	123.7
Tamilnadu	66.7
A.P.	50.0
Haryana	45.5
Gujarat	38.6
Karnataka	34.4
Kerala	32.9
W. Bengal	32.8
U.P.	32.2
Maharashtra	26.6
Jammu & Kashmir	21.8
Himachal Pradesh	19.5
Bihar	18.0
Madhya Pradesh	10.9
Orissa	9.9
Rajasthan	7.9
Assam	3.3
All India	34.6

20 Fertiliser News. July 1982. - op.cit.p.143

It can be seen from the figures shown in Table that the per hectare consumption varies from 124 kg. in the case of Punjab to a meagre 3 Kg. in the case of Assam. Again, while Punjab tops the table with 124 kg. per hectare, the second heaviest consumer, namely, Tamilnadu has only around 50% of Punjab's level of consumption ~~per hectare~~. And only five states consume more than the national average consumption. This shows that the rate of application of fertiliser widely varies in different parts of the country.

Even within a particular state, there are wide variations in levels of fertiliser consumption from district to district. A group of 50 districts out of the total of 412 districts in the country, account for more than sixty percent of the total consumption of fertilisers in India. To be more precise, in the year 1980-81, 63 percent of fertiliser consumption was accounted for by 46 districts. The details are furnished in Table 12 below

TABLE - 12

Classification of districts according to range of consumption and their share in total fertiliser consumption (N + P + K) in 1980-81 [21]

Range of consumption	No. of Dists.	% of the Dists to the total no of Dists.	% share in consumption	Cum. % share
Above 40000	31	8	32	32
30001 - 40000	17	4	10.5	42.5
20001 - 30000	46	11	20.5	63
10001 - 20000	122	30	19	82
5001 - 10000	51	12	7	89
Below 5000	145	35	11	100

21. Fertiliser Statistics 1980-81., op.cit., p.I- 127

It can be seen from Table-12 that thirty percent of the districts in India account for 82 percent of the total fertiliser consumption, the other seventy percent accounting for a mere eighteen percent of the total consumption. In other words, the level of fertiliser consumption varies in the ratio of 1:10 between the low consumption districts and the others. The highly skewed pattern of fertiliser consumption in India is high lighted by G.V.K. Rao in the following words:-

> "We increased our annual fertiliser consumption by 25 lakh tonnes of nutrients from 1974-75 to 1978-79. Strikingly, 8.7 lakh tonnes of these additional nutrients went to just 36 out of over 380 districts in the country; these were already high consuming districts..... This uneven sharing of the increase in fertiliser consumption, and continued skewness in our consumption pattern is one of our major weaknesses".[22]

There are several reasons for such a skewed consumption pattern. Some areas enjoy a favourable combination of factors that facilitate high consumption of fertilisers while in other areas these factors are very weak. Some of these factors are socio economic, some are infra-structural and yet others are institutional. The attitude of the farming community of the area appear to be a very significant factor.

In the opinion of Dr. M.S. Swaminathan,

"Variations in the fertiliser consumption are more marked than variations in the net area irrigated, suggesting thereby differential adoption of chemical fertilisers in different states".[23]

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22. Rao., G.V.K., Proceedings of fertiliser seminar-1979, F.A.I(ed) New Delhi,1979 p.3.

23. Swaminathan, Dr. M.S., Performance and potential of Indian agriculture, op. cit., p.24

S.S. Puri points out that "As against 95 percent of the households using fertiliser in Punjab, less than 6 per cent of the households in Assam are reportedly consuming fertilisers. In the states of Madhya Pradesh, Rajasthan, Orissa and Himachal Pradesh, the percentage of households using fertiliser varies between 15 to 35".[24]

Crop to crop unevenness in Fertiliser consumption:

The Indian Agricultural Statistics Research Institute (IASRI) have indicated on the basis of a sample survey of 38 districts spread over 15 states of the country covering 5 major cereals namely rice, wheat, maize, jowar and bajra and two cash crops, namely groundnut and cotton, the rates of application of NPK nutrients by farmers to the different crops in 1975-76, separately for HYV and for local varieties. These indications are reproduced below:

TABLE-13

Average rate of NPK application by farmers during 1975-1976.[25]

(kg/ha)

Sl. No.	Crops	High yielding varieties	Local varieties
1.	Paddy (Kharif)	144.4	105.6
2.	Paddy (Rabi)	170.2	127.1
3.	Paddy (Average)	152.3	110.7
4.	Wheat	144.0	98.9
5,	Maize	128.0	98.5
6.	Jowar	72.5	36.0
7.	Bajra	88.1	42.6
8.	Average of 5,6,7	96.1	59.0
9.	Groundnut	75.8	58.0
10.	Cotton	135.4	50.4

24. Puri. S.S., "Meeting farmers'needs - A peep into the future" in Development of fertilisers in India., op.cit., p.191.

25. Cited by Mahdi S.S. in "Fixation of All India and Statewise consumption targets" paper presented at the FAI Seminar, New Delhi,1981. p.3

It can be seen from the above figures that there are very wide variations in fertiliser consumption from crop to crop from 170.2 kg./ha in respect of paddy (HYV, Rabi) to 36 kg./ha in respect of Jowar (local variety).

Disproportions in the consumption of the three nutrients (N, P & K)

India, at present, consumes the three main fertiliser nutrients N, P & K in the ratio of 6:2:1 (Please see Table 14). Evidently, the consumption of Nitrogen is relatively far higher than the consumption of the other two fertiliser nutrients. A better balance among the three nutrients is very much called for. Admittedly, a perfect balance of 1:1:1 is not necessary. After all, fertiliser application should depend on the nutrient status of the soil. If a particular area is rich in Potash, there is no need for applying further large quantities of Potash to that soil. But, when the consumption of the different nutrients, relative to the conditions of the soils, is lop sided, corrective action is definitely called for.

Table 14 gives the details of the ratio in which India has consumed the different fertiliser nutrients in 1961-62 and in each year between 1976-77 and 1981-82.

TABLE- 14

Consumption ratio of fertiliser nutrients 26

Year	All India consumption ratio of		
	N	P205	K20
1961 - 62	8.9	2.2	1.0
1976 - 77	7.7	2.0	1.0
1977 - 78	5.8	1.7	1.0
1978 - 79	5.8	1.9	1.0
1979 - 80	5.8	1.9	1.0
1980 - 81	5.9	1.9	1.0
1981 - 82*	6.0	1.9	1.0

It can be seen from Table that the fertiliser consumption has shown a better balance of 5.8:1.7:1 in 1977-78 as compared with 8.9:2.2:1 in 1961-62. But after 1977-78, there has been no improvement in this respect. In fact, thebalance has deteriorated somewhat. This sort of lopsidedness becomes more evident when one examines the consumption pattern on a zonal basis. The zone wise picture is as follows:

TABLE - 15

Zone wise NPK ratio in fertiliser consumption
1981-1982 27

Zone	Ratio N	: P	: K
Central	10.6	2.9	1
East	5.7	1.7	1
North	17.4	5.5	1
South	3.8	1.3	1
West	4.4	1.8	1
Others	-	-	-
All India	6	1.9	1

26. Fertiliser statistics - various issues., op.cit.

26* and 27. Fertiliser News. July 1982., Op.cit., p.144.

Projections for
the future:

Accurate projections of the production, consumption and imports of fertilisers in India over the next five or ten years are difficult to be arrived at. It is partly due to the difficulties inherent in such projections and partly due to the problems that are peculiar to India.

Normally, projection of fertiliser production should be an easy exercise. But in India, usually there are long delays ~~slippage~~ in the schedule of construction and commissioning of new fertiliser plants. There are also unforeseen variations in the extent to which the available installed capacity is put to production. Further more, the projection exercises and forecasts suffer from lack of objectivity with the result that the projections tend to be either over optimistic or over pessimistic. As regards consumption again, apart from the effect of the usual unforeseen factors such as weather, there is also a tendency to confuse desirable levels of fertiliser consumption as synonymous with forecasts of effective consumption.

After going through the fertiliser consumption forecasts developed by different agencies in India, Balu Bumb points out that "In spite of the critical role played by the future projections, a suitable forecasting methodology based on realistic behavioural assumptions is still lacking." 28

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28. Balu Bumb, <u>A survey of the fertiliser sector in India</u>, staff working paper No. 331, World Bank, Washington, 1978.p.22.

Notwithstanding the inaccuracies, it is worthwhile to go through the projections of fertiliser consumption and production developed by the different agencies. The projections of fertiliser production and consumption made by the Planning Commission of India are presented in Table-16. They relate to the terminal year of the sixth five year plan i.e. 1984-85.

TABLE - 16

Projection of fertiliser production and consumption - 1984-85 [29]

	Consumption	Production	Gap
	(in million M.T.)		
N	6.00	4.20	1.80
P	2.30	1.40	0.90
K	1.31	Nil	1.31
		Total gap	4.01

The projections of consumption worked out by the Ministry of Agriculture and the Fertilizer Association of India (FAI) for 1984-85 and 1989-90 are given in Table-17 below..

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29. Planning Commission, Government of India, VI Five Year Plan 1980-85, New Delhi, 1980 p.265

TABLE- 17

Consumption forecasts[30]

in ('000 M.T.)

	1984 - 85 Ministry of Agriculture	1984 - 85 FAI	1989 - 90 Ministry of Agriculture	1989 - 90 FAI
N	6000	6434	8500	9883
P	2338	1761	3500	2558
K	1316	993	2003	1486

K.C. Sharma and R.R. Poricha have developed a balance sheet of fertiliser production, consumption and gap during 1984 - 85 and 1989 - 90. They have taken into account the creation of additional production capacity as per projects approved till the end of 1980. They have also reckoned the normal rate of utilisation of the established production capacity. As regards consumption estimates, they have taken the projections of the Ministry of Agriculture of the Government of India. They have left out Potash as Potash is, in any case, imported totally and there is no need to do a separate exercise for determining the gap between consumption and domestic production in respect of Potash. The balance sheet drawn by them in respect of Nitrogen and Phosphate is shown in Table- 18.

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30. Cited by Sharma, K.C. and Poricha, R.R; "Growth of Fertiliser Industry - the next decade", in Development of Fertilisers in India, op.cit. p.134

TABLE-18

Likely gap between indigenous availability and demand upto the end of the decade [31]

('000 M.T.)

Year	Nitrogen			Phosphate		
	Consumption	Production	Gap	Consumption	Production	Gap
1984-85	6,000	4,330	-1,670	2,338	1,115	-1,223
1989-90	8,500	5,400	-3,100	3,500	1,115	-2,385

IMPORTS OF FERTILISERS

It has already been stated that India continues to be a net importer of chemical fertilisers, despite all the efforts at augmenting domestic production. The expansion in production has not been able to catch up with the growth in consumption. As far as potassic fertilisers are concerned, in the absence of any domestic source of supply, India inevitably depends on imports for her entire requirements. In the case of nitrogenous and phosphatic fertilisers, India imports the quantities required for bridging the gap between domestic production and consumption.

In the fifties, imports were limited to nitrogenous and potassic fertilisers. There was practically no imports of phosphatic fertilisers, as domestic production was adequate to meet the then existing levels of consumption. In the sixties, India had to import nitrogenous, phosphatic and potassic fertilisers in an ever increasing measure. This trend more or less continued in the seventies too. Appendix XI gives the details of year by year imports of fertilisers in India from 1970-71 to 1981-82.[32] It can be seen from Appendix XI that the import bills of India have gone on mounting year by year and reached the peak of Rs. 723 crores

31. Ibid; p.137

32. Please refer Appendix-XI, page 389 .

in 1975-76. The main reason for such a steep increase in the import bill in 1975-76 was the sharp escalation in fertiliser prices that year due to the spurt in oil prices. In the next year, i.e. 1976-77, the import bill however came down as the prices of fertilisers in the international market registered a downward trend.

In the next three years, i.e. from 1977-78 to 1979-80 the imports of fertilisers were at a moderate level. The import bills were well below. the peak of Rs.723 crores reached in 1975-76. In 1977-78 it totalled up to Rs.306 crores, in 1978-79, Rs.460 crores and in 1979-80 Rs.555 crores. But, in 1980-81, there was again a steep jump in the value as well as quantum of fertilisers imported by the country. The country very much wanted to reduce the dependance on imports during 1980-81, by increasing domestic production through expeditious commissioning of the plants under implementation and better capacity utilisation of the already running units. But, as was noted earlier, the actual result was disappointing on both counts and the imports could not be avoided or reduced. The import bill in 1980-81 touched the all time high of Rs.925 crores of foreign exchange. It was partly due to the fact that the fertiliser prices in the international market again went up that year substantially. In terms of quantities, it consisted of 1.5 million M.T. of N, 0.45 million M.T. of P and 0.8 million M.T. of K.

In 1981-82 imports of fertilisers was substantially lesser as compared with 1980-81. Yet, the value of imports in 1981-82 touched Rs.717 crores. In terms of quantities, it amounted to one million M.T. of N, 0.34 million M.T. of P and 0.64 million M.T. of K.

Presently the imports are mostly in the form of Urea, MOP and DAP.

An analysis of the pattern of imports in relation to the actual consumption, reveals that imports expressed as a share of consumption, has been coming down, though, in absolute terms, imports have been going up. The analysis also reveals that the imports in any particular year do not match the gap between consumption and domestic production in that year. Usually, the imports vary widely from year to year. Also, in some years the imports are considerably in excess of the gap between consumption and domestic production and in some other years, the imports are very much lower than the gap. The surplus imports in some years actually get consumed in the succeeding years. The consumption does not suffer in the years of low imports. It is sustained by heavily drawing down on the inventories built up by the previous years' imports. For example, during 1979-80, imports of N, P & K formed 101.6%, 61.2% and 78% of the respective gaps between consumption and domestic production. The unbridged gaps in P & K was met by drawing down on the inventories.

Need for proper planning
of imports:

It is evident that imports of fertilisers require proper planning and a durable strategy. Basically, the job involves the bridging of the gaps between consumption requirements and production prospects. In practice, the task is not however that simple. The consumption targets and production prospects have to be critically examined and carefully evaluated. The extent to which the installed production capacity is presently utilised and the extent to which it could be stepped up have to be evaluated. Planning of imports will also have to take into account the requirements of buffer stocks of fertilisers in the country and the likely pattern of prices of fertilisers in the international markets.

Carelessness in planning of imports of fertilisers will cost the economy a great deal. It will also affect adversely the viability of the domestic fertiliser industry. Some of the features of fertiliser imports in India will be discussed in a couple of succeeding chapters of this thesis.[33]

SELF SUFFICIENCY IN FERTILISERS:

From the analysis of India's imports of fertilisers and the projected balance sheet of consumption, domestic production and gap, it will be obvious that self-sufficiency for India in fertilisers is a long way off. Though India has been planning for self-sufficiency in fertilisers ever since the country attained independance in 1947, it has been consistently slipping in this objective. The three main reasons for not achieving self sufficiency in fertilisers have been (1) sufficient production capacity had not been planned and provided for in time; (2) The execution of the sanctioned projects with a few exceptions took unduly long time; (3) The rate of utilisation of the capacity already created was poor.

33. Please refer chapters 9 and 10.

A very interesting and a very significant point emerges when we analyse, side by side, the rate of utilisation of the fertiliser production capacity already created in the country and the extent of the country's dependance on imports. The capacity utilisation of the fertiliser industry in India has oscillated over the years around two third of the total installed capacity, leaving idle one third of the total capacity.[34] The fertiliser imports in India have also oscillated over the years around one third of the total consumption requirements.[35] In other words, the extent of dependence on imports and the extent of unutilised domestic capacity of production more or less match with each other. If it is possible to turn out a hundred percent utilisation of the installed capacity, there will be no need to import any fertilisers into the country. The goal of self-sufficiency in fertilisers, aimed at for the last thirty years can be achieved without bringing in fresh production capacity. This may, however, be difficult in the existing circumstances. **Accordingly, the nation may have to continue the imports for some more years.**

Moreover fertiliser consumption cannot be frozen at current levels. There is need for increasing the consumption. And so long as the deficit between domestic production and consumption requirements persists, the deficit has necessarily to be made good through imports, for otherwise, food production may fall and the import bill for food can be much larger than that for fertilisers. However, atleast the quantum of imports could be reduced considerably by expeditious completion of the new units and improved utilisation of the capacity of the existing units.

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34. For details please see Appendix VI , page 384

35. For details please see Appendix XI . page 389 .

CHAPTER - 7

THE FERTILISER MARKETING SYSTEM

Fertiliser marketing in India has been a unique process:

Marketing of fertilisers in India has been a rather unique process. It has differred significantly from the marketing of other products in the country. Its impact on the country has been in three major directions: (1) Commercially, the fertiliser business has emerged as one of the largest businesses in the country. (ii) Economically, the process has resulted in a revolution in agricultural production, especially food production in the country. (iii) Sociologically, it has made a significant contribution to the continuing transformation of a traditional rural society into a more modern one.

The unique features of the system:

The unique features of the fertiliser marketing system can be appreciated better if one traces it to its genesis and growth.

Marketing in India has generally been synonymous with urban marketing. The industrial expansion especially in the post independent era brought into the market a large spectrum of industrial and consumer goods. These were sold essentially in the urban markets, to urban consumers. To cater to these urban consumer segments was a comparatively easier job. Communication was easy. To sense their existing needs, to arouse their latent needs, to create new needs in them and to serve those needs was a job for which certain proven marketing approaches and methods were already available. The urban consumers were generally amenable and accessible to the marketing strategies, promotional appeals and advertisement messages brought out by the marketers of consumer goods and industrial goods. Consumer goods like textiles and cosmetics were some of the first in which the socalled modern marketing techniques were applied. In dealing with an urban clientele, the marketers of consumer goods generally adopted the marketing techniques developed in the West with some modifications.

This marketing process, which was mostly directed at the urban middle classes was not suitable for the marketing of fertilisers. The tools and techniques and the tempo and style of marketing consumer goods in an urban setting were not quite applicable to communicating with the farmers and peasants of rural India.

It was a totally new market, involving a totally new customer - one with just a loin cloth on his body who had not seen the portals of a school. His life and ambitions were confined to the four bunds of his small paddy or wheat field. He could understand only his village dialects. To add to this complexity, the product was a new one, the use of which was totally alien to the culture and age old practices of rural India. To most Indian farmers even the names of chemical fertilisers sounded alien. Their attributes were yet to be proved. It is this combination of a new market, a new customer and a new product that made fertiliser marketing different from the marketing job in the urban markets. In other words, the uniqueness of fertiliser marketing has been due to the uniqueness of the market, the uniqueness of the consumer and the uniqueness of the product.

The market is unique:

The market for fertilisers is significantly different from the market for consumer goods. The market for fertilisers is constituted of the villages of India. The six lakh villages in the country constitute a market segment quite different from the towns and cities. Though the basic principles and techniques of marketing may be applicable equally to the urban and rural areas, when it comes to a question of operating a marketing system, problems of a different magnitude and complexity arise in the rural market. The Rural India has been to a large extent bypassed by the various social, and economic developments that have taken place in this country. It is a market of more than five hundred million people, a market in which the consumers are widely scattered. It is also an extremely diverse and heterogeneous market. Cultural, religious and linguistic diversities are the hall marks of the rural market of India. The market is also characterised by wide economic disparities. Appallingly low standard of living and extremely poor purchasing power are the common features of the market. In other words, a combination of economic and social backwardness characterise the rural market of India. In the early stages of fertiliser marketing not much of ready demand existed for the product. It was just a mass of three hundred or four hundred million people that had to be called a market - the rural market of India. In direct contrast to the growing, prospering and thriving urban India, the rural market of India was characterised by its conservatism, traditionalism, ignorance and poverty.

The consumer is unique:

In fertiliser marketing the farmer is the consumer. The fertiliser consumer constitutes a completely different segment from the urban middle class consumer, at whom most of the marketing activity in India is aimed at today. There are significant differences in the buying behaviour.of the fertiliser consumer and the consumers of other goods. The consumer segment for fertilisers is constituted by a large mass of illiterate, tradition bound, poverty-striken farming community widely diffused geographically all over the country where the farming conditions vary widely from area to area.

Each aspect in this consumer profile had a special significance to the fertiliser marketing man. Illiteracy was a barrier to be met in marketing communications. The scattered nature of demand meant a serious challenge in physical distribution. The traditional outlook of the farmers meant a challenge in extension, conversion and training. The poor purchasing power of most of the farmers created some other hurdles. Credit had to be found for the purchase of the product and innovative marketing systems had to be found, linking supply of inputs with supply of credit.

The product is unique:

The fertiliser marketing man in India had not only to face a unique market and a unique consumer but also a unique product for the conditions of the country. As a product, fertilisers are differentiated from other consumer and industrial goods. The product is an input with which the farmer can hopefully increase his returns. There is also no certainty about returns when he uses the fertiliser. Farming in India is characterised by several uncertainties and fertiliser by itself cannot do the trick. Fertiliser is but one new item in a large package of factors, most of which are, in the present context of the country, uncontrollable. The elements of risk are numerous in Indian farming and the use of costly chemical fertilisers is a controllable new variable which the average Indian farmer is exhorted to consume with no certainty of success.

Moreover, the use of this product implied a total change in the agricultural technology. Its use implied the conversion of the farmer into an entrepreneur. It involved the adoption of the new technology, by large masses of peopld. In fact, it was the sheer, weight of the large masses of people that required to be converted, that made the fertiliser marketing job extremely challenging. It also implied the need to communicate and educate on an unprecedented scale to an audience deeply entrenched for many years in traditional technology about the need and desirability of change.

Fertiliser is a highly seasonal product. It is required only once or twice or thrice in an year. The extent of seasonality involved in this product has been dealt with in detail in the previous chapter.[1] The high degree of seasonality of the product adds to the uniqueness of fertiliser marketing and makes it a still more complex process.

Fertiliser is also a high cost product, used in high volume. Fertiliser cost was in the range of Rs.200/- to Rs.500/- per tonne in the early days after independence and is around Rs.2350/- to Rs.3600/- per tonne now. It was difficult to store it because of the large volume and high costs involved.

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1. For details please see chapter-6, pp. 94-96

Agriculture by itself is
a unique venture:

Another problem in fertilizer marketing related to the uncertainties associated with agriculture in the country. These uncertainties are caused by the very nature of farming, and are complicated by the conditions that are peculiar to Indian farming. It is very difficult to establish a measurable relationship between the cost of fertiliser and the returns derived from it. This feature of farm operations is the most significant factor that makes an agricultural input like fertiliser, different from most other products.

To quote Sri Shyamal Banerjee,

> "One almost ubiquitous characteristic of demand for an economic good is a measurable relationship between the cost of a good and its utility - by way of return or satisfaction. A consumer good has a demand in proportion to its utility or the consumer's satisfaction. A capital good is valued and, therefore, demanded, based on its return to the owner or user .... In organised industries and business, the initial effort is clearly linked with the ultimate outcome. There is hardly an investment in industry which, in one form or the other, is not preceded by a feasibility study or evaluation. This study is prognosis of what investments are needed, for what results and with what annuities or return on the initial investments .... Farming conditions are dissimilar to industrial situations. The profit orientation or return computation in industry has an assumed basis of certainty or near certainty of fulfilment. In the farm sector, the condition of operation and the so-called economic infrastructure and super-structure

> are all inadequately developed as yet. Thus, a farmer who takes to farming for the first time is often not quite sure whether he can carry it out successfully even if he has the resources. Having launched such an operation, he is not quite in command asmany external factors can spell hazard to his success. In Western countries where farming has been industrialized, conditions are more controlled than in India. First is water management. Our dependence on monsoon and uncertainty of irrigation are still a deterrent. Crop management and technologically sound practices are as yet not quite standardized; the attack of pest, disease and foul whether is still quite common especially in humid conditions of farming. These and many other factors are still largely beyond the control of farmers." 2

It is well known that the Indian farmer is under the constant threat of adverse weather conditions. Chemical fertiliser further compounds the financial risk of his farming operations. To him there is no insurance other than his faith in God and he can turn to none if his crop fails due to drought or flood.

The uniqueness of the market, the consumer and the product and the uniqueness of the farming operations described above had many implications to the fertiliser marketing man. These resulted in certain problems in physical distribution, channel operations and mass communications.

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2. Banerjee Shyamal; "From Tradition to modernity" Fertiliser News, October 1976 The Fertiliser Association of India, New Delhi, P.8

Special problems in physical distribution:

One of the prime tasks in fertiliser marketing is to design and implement a physical distribution system that is most suited to the rural areas, keeping the costs of distribution as low as possible, guaranteeing at the same time, a minimum level of service to the consumer and ensuing timeliness of supplies. The main hurdle in accomplishing this task was the absence of an established distribution infrastructure in the rural areas. The lack of proper facilities of transport, storage and communications posed special problems in marketing. Most of the rural areas are not served by rail or road adequately. Rail linkage is not available to most parts of rural India. Where roads are available, they are often kutcha roads and not adequate to carry heavy loads. During the monsoons, some parts are totally inaccessable, even by roads. And the bridges on roads are not designed to carry heavy loads.

Storage is another problem area like transportation. Good warehouses are not available in the rural areas. Fertiliser requires extensive warehousing. It has been an uphill task in fertiliser marketing to establish the required warehousing facilities in the interior parts.

Special problems in operating distribution channel:

Just as a number of problems are encountered in physical distribution, a number of difficult problems are encountered in creating and managing the distribution channel. The fertilisers had to be made available through innumerable outlets spread in every nook and corner of rural India. The fertiliser marketing man had to start from the scratch and create a distribution channel. Choosing a channel model and developing a network of retail outlets in the interior parts pose a host of problems. Getting a bunch of competent dealers in the rural areas was by no means an easy task. The fertiliser marketing man had to choose some from the traders and money lenders available in the rural areas, absorb them as his dealers and develop them in course of time. He also had to persuade the village level cooperatives to take up fertiliser dealership. Some of the fertiliser firms went to the extent of providing the required storage space to thetrader and entrusting him with the stocks of fertilisers, with the understanding that he need pay for the stocks only when he sold the stocks. This consignment system was the forerunner of today's fertiliser distribution structure.

Again, controlling and administering the channel members was an equally hazardous task. The fertiliser manufacturer had to depend on several links structured into many tiers for reaching the farmers. And he could not directly take up the responsibility for operating these forward links in the distribution chain in view of the cost, complexity and magnitude of the task. He could exercise direct control only over the first links in the chain - the ones that formed an integral part of his outfit, viz, company's own branch office and buffer stock points. When direct control by the manufacturer over the forward links in the chain was difficult, it meant, some special hurdles in distribution. These hurdles had to be met by employing a large sized sales force.

Furthermore, as said earlier, fertiliser marketing meant selling a high cost product to a market having a very low purchasing power. This was a fundamental problem that challenged the fertiliser marketing man. Extension of liberal credit was the only feasible answer. But, this implied the problems of credit management and recovery of dues. Even if the fertiliser marketing man was willing to extend credit to the distribution channel, he could get very little security to support the credit.

Special problems in promotion and mass communication:

Advertising, promotion and mass communication was another challenging area on fertiliser marketing. This is particularly because the fertiliser marketing man just did not have the required media to reach the farming community. The media that was available was not effective and the media that was effective was not available. Printed media was available in the rural areas to an extent, but its scope in fertiliser promotion was limited because of the illiteracy of a majority of farmers. The other traditional media also had limitations in the rural context in terms of reach, cost, coverage and effectiveness. Visual and audio-visual media, however, had greater scope. So also word of mouth communication through dealers and opinion leaders. Television would have been an effective medium for fertiliser promotion but the country entered the television era only recently; paradoxically, the rural areas are not covered by television.

Apart from the non-availability of an appropriate communication medium, promotion became a problem in fertiliser marketing for another reason. Fertiliser marketing meant the introduction of a new product. While manuring the field is a concept known to the farmer the use of chemical fertilisers was new to him. And therefore, both generic promotion and brand promotion had to be done simultaneously. This put an additional burden on the marketing man. Fertiliser marketing required more strenuous promotional efforts than what was ever required for promoting some of the consumer goods whether in the rural market, or in the urgen market. The novel and technical nature of the product demanded special innovative promotional efforts.

Special problems in other functional areas:

Apert from the special problems in the areas of physical distribution, channel management and mass communication, the fertiliser marketing job has some special problems in certain other areas such as personal selling, presale and aftersale service, marketing organisational structure, marketing controls, marketing research activities, etc.

Fertiliser marketing is the first organised effort on a massive scale in rural marketing in India:

An in depth study of the evolution and growth of fertiliser marketing in India will clearly reveal that fertiliser marketing is the first largescale effort in rural marketing in India. It is the fertiliser sector that should legitimately get the credit for being the pioneer in rural marketing in the country. It is not forgotten here that some consumer goods had entered the rural markets of India before fertilisers entered those markets. But the marketing of none of these products involved such large volume and massive effort as the marketing of fertilisers did. Nor did it involve such social innovation and incessant process of education as fertiliser marketing did. Also, the marketing effort, in the other sectors was nowhere near the effort in the fertiliser sector in its impact on the rural masses of the country. In style, size and impact, the marketing effort in the fertiliser sector was a class by itself, unmatched by any other sector.

For example, manufacturers of consumer goods like tea and vanaspati did make commendable efforts at rural marketing in India, even in the early stages of the evolution of the overall marketing process in the country. But those goods differed from chemical fertilisers in the kind of satisfaction they provided to the consumer. Consumer products like tea and vanaspati were intended to provide immediate and direct satisfaction to the users. The users directly experienced the value and utility of the products. Without belittling the market development work done by the marketers of these products, it must be mentioned that no such fundamental conversion in attitudes and practices was involved in the marketing of these products as in the case of chemical fertilisers. Again, the turnover and quantity involved in the sale of these products was considerably limited when compared to the huge volume and huge turnover involved in chemical fertilisers. The 'risks' as perceived by the consumer are consequently much greater. While consumer products mentioned above were aimed at a particular segment of the rural population characterised by income, education or age chemical fertilisers had to be aimed at practically the entire rural India. That way, fertiliser marketing demanded a penetration and a physical coverage which no consumer good did to the same extent. Literally, millions of tonnes of fertiliser products had to be transported to rural India, stored in several rural warehouses and distributed to millions of farmers.

Major experiment in rural communication:

Fertiliser marketing also meant the first large scale experiment in rural mass communications in India. Fertiliser was a product that demanded a real demonstration of its utility. It was a technical product. And the very process of demonstrating the efficacy of this product involved a good deal of time, men and money. No instant demonstration was possible. To convince the farmer was not easy. 'The Promise of Plenty' couched in a rural idiom with a rural theme and a rural appeal had to be made. For years together, in chosen farms and crops farmers had to be shown the efficacy of the fertilisers; more than that, they had to be convinced that the product will not spoil their crop and soil.

Birth of a new era:

The entry of fertilisers in the rural markets of India on a large scale was in a way the birth of a new era. Marketing men without the benefit of past experience of marketing that product, were plunging into the difficult rural market with a difficult product.

The experiment however, did succeed as the history of fertiliser marketing in India for the last twenty five years will show. The marketing men could break though very slowly the barriers of the Indian farmer and make him accept this product as a clue to his profit. It goes to the credit of the fertiliser marketing men that they could do so in such adverse circumstances. The growth of fertiliser consumption in India from the scratches in the fifties to its present day heights is the real testimony to the success of their endeavours.

This is not in any way to ignore the significance of the governmental efforts in the same direction. Governmental efforts were significant in respect of educating the farmers and in providing incentives to the farmers to use fertilisers through subsidies and other means. The extension work done by the several agencies of the Government - in particular the Departments of Community Development and the Departments of Agriculture at the State and Central Government - is also worthy of special mention here. But it must be realised that this is only a pant of the total marketing effort that was required in respect of making fertiliser consumption part of a way of like for the farmer. Complementing the activities of the Government were the remarkable efforts in fertiliser marketing put in by the manufacturers and distribution agents. This was not perhaps as apparent as the governmental efforts were, but nonetheless equaly necessary and fruitful.

The social implications:

It is incorrect to view fertiliser marketing purely as a commercial process ignoring its sociological content. Fertiliser marketing in India, from the time it made the first inroads into the rural areas of the country till today, has retained a real social content. At no time, was it a purely commercial venture. At the same time, the well accepted commercial principles were also applied in this marketing process. It is to the credit of fertiliser marketing efforts in India that it was able to strike a happy balance between the social and commercial requirements of the business, unique as it was. It will not be inapt to say that fertiliser marketing was the major effort in social marketing in India. It was not a mere profit making venture for the industry. It meant taking the results of science and technology to the rural people. It also contributed to converting the home need based farming system of India into a market oriented farming system from a feudal to a capitalist farming system. Indirectly, it aimed at the improvement of the quality of life of the rural masses of India, Truly, it helped to lay the foundations of a social marketing process in India.

Transfermation from tradition to modernity:

The process of fertiliser marketing in India has involved an experiment in breaking tradition and bringing in modernity among vast masses of people living in rural areas. Undeniably, the fertiliser marketing men, have made praiseworthy efforts in breaking the pyschological barriers and knowledge barriers of the Indian farmers. They took science and technology to rural India and offerred it in a manner digestible by the farming community. Tireless extension work has been an integral part of this process. Discerning analysts of the process of fertiliser marketing in India have correctly under scored the sociological content of the process. They have recognised that the process had combined at the same time, a sociological experiment as well as an economic experiment. As Mr.B.Venkatappiah, former Governor of the Reserve Bank of India says, "Fertiliser marketing involves at once a sociological-cum-economic enquiry of the most sophisticated type on the one hand and an extension-cum-sales promotion of a most complicated nature on the other".[3]

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3. Venkatappiah. B; keynote address presented in the seminar on fertilisers held by The Fertiliser Association of India, New Delhi, 1967. P. I.3

Highly coordinated effort:

In another aspect too, fertiliser marketing set the trend for the overall rural marketing process. This was in the matter of coordiation of efforts by different agencies. Fertiliser marketing was a sector where coordination of efforts was very essential, especially in matters of distribution and promotion. Agencies of Central and State Governments and fertiliser manufacturers and marketers pooled their resources and experiences and nurtured this marketing process. Such coordination was the natural outcome of the recognition of the enormity of the task.

Evolution of the Fertiliser marketing system:

A detailed study of fertiliser marketing in India shows that it has evolved through three distinct phases of development. Each of these phases has had its own special marketing features. In fact, each phase has been the result of the marketing environment existing in the country at that time.

The first phase:

The first phase covers the period from the beginning of the twentieth century to the early 1940's. Some pioneering efforts were made during the period in promoting fertiliser use. But no significant strides in fertiliser marketing took place in this period in the country. Fertiliser sales were meagre and were confined to the plantation crops like tea and coffee.

Parry and Co. of Madras, was the first firm in India to market fertilisers in the country. It marketed superphosphate manufactured in their own unit in Tamilnadu. Imperial Chemical Industries (ICI) was another pioneer in fertiliser marketing in India. It imported and marketed Ammonium sulphate and Ammonium nitrate.

The going was certainly not easy for the pioneers in fertiliser marketing. It took them considerable time and effort to popularise fertiliser use. Even after the initial barriers were broken, the progress in fertiliser use was very slow throughout the first phase of the evolution of fertiliser marketing in India.

The second phase:

The second phase commenced from 1944 and extended till the sixties. It is during this phase that fertiliser marketing became an important function in the country. The creation of the Central Fertiliser Pool (The pool) by the Government of India in 1944 marked the beginning of this phase of fertiliser marketing in India. The pool, as the name would indicate, was supposed to pool all the fertiliser products - domestic and imported materials and distribute them in all the states at controlled prices. As Sri Heredia says, the pool was created with the objective of "ensuring the equitable distribution of the available fertilisers at fair prices to all provinces of the country. Obviously, at this stage in the history of fertiliser marketing in India, the emphasis was not on 'marketing' but on 'rationing' of the available fertilisers".[4]

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4. Heredia, F.J; "Evolution of a fertiliser marketing system, a critical review", paper presented at the seminar held by the Fertiliser Association of India, New Delhi, 1980. p.I-2

The pool consisted of ammonium sulphate, urea, CAN and ASN. Superphosphate and fertiliser mixtures were, left outside the pool. The distribution of the pool fertilisers was effected through the cooperatives and a few private dealers specially licensed in this behalf. In many states, the departmental (government) sales outlets dominated the marketing of fertilisers in the early years. The fertiliser availability, was mainly from the imports and was very irregular - varying from year to year. Again, neither the quantum of fertiliser used nor the degree of fertiliser consciousness was uniformly spread through out the country. Consumption was confined to a few pockets and a few crops.

The creation of the fertiliser pool more or less coincided with the introduction of the Grow More Food campaign about which reference was made earlier.[5] This campaign was launched with the objective of achieving self sufficiency in food output.

A characteristic feature of the second phase of the evolution of fertiliser marketing in India was the active intervention of the government in the fertiliser business. In the years that followed India's independance (1947), and especially from the latter half of the fifties, the government, in the centre and in the states, enlarged their control over the production, imports and distribution of fertilisers.

The declaration of fertilisers as an essential commodity under the Essential Commodities Act, 1956 (ECA) was a major land mark in the second phase of the evolution of fertiliser marketing in India. Government considered it desirable to regulate the quality and distribution

5. Please see Chapter -4, page 50

aspects of fertilisers in addition to its price. The Fertiliser Control Order (FCO) was issued by the government in 1957 under the ECA. The FCO regulated the quality, price and trading of fertilisers. This also necessitated the licensing of fertiliser outlets, both wholesale and retail. The declaration of fertiliser as an essential commodity under the statute clearly indicated the high degree of importance that the government attached to this commodity. It also set the pattern for several other regulations that the government exercised on this commodity in later years.

Another major landmark in fertiliser marketing that took place in this phase was the publication of the Report of the Committee on Fertilisers.[6] The Committee was appointed to examine the long term and short term problems connected with distribution of all chemical fertilisers - nitrogenous, phosphatic and potassic, and to recommend measures for evolving an effective system of distribution of fertilisers with a view to bringing about a rapid increase in their use for increased agricultural production. The Committee was also to examine the question of fertiliser prices, the role of cooperatives in fertiliser marketing and the role of extension services in the promotion and popularisation of the use of fertilisers.[7]

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6. The Government of India appointed a Committee under the Chairmanship of Sri B. Sivaraman in 1964. The Committee submitted its report in 1965. The report is popularly known as Sivaraman Committee Report.

7. Government of India, Ministry of Food and Agriculture, Report of the Committee on fertilisers, New Delhi 1965. p.89

The Sivaraman Committee report articulated the objectives of fertiliser marketing in the following terms:[8]

"(i) Guaranteeing availability of fertilisers at fair prices in the remotest corners of the country so that no part of it is kept outside the growth potential.

(ii) Building up a good fertiliser distribution system by activating the cooperative sector

(iii) Carrying the message of balanced fertiliser application to all parts of the country."

One of the important recommendations of the Committee was to allow the manufacturing units in the country to distribute a part of their production of nitrogenous fertilisers through their own distribution system. This was done with the idea that when the indigenous production increased substantially, there will be a competitive distribution system between the cooperatives who were hitherto having a near monopoly in the business and the private trade. Experience showed that this was a crucial and wise recommendation. The acceptance of the recommendation brought about major changes in fertiliser sales.

The Sivaraman Committee also highlighted the importance of fertiliser promotion in stimulating consumption of fertilisers and increasing food production. The Committee went to the extent of recommending the creation of a separate Fertiliser Promotion Corporation, - a unified agency for the promotion and distribution of fertilisers.

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8. Ibid; pp. I - II

The report envisaged the following responsibilities for the proposed corporation.

" (i) Taking charge of a massive promotion programme throughout the country to ensure the consumption of large quantities of fertilisers programmed to be made available in future by organising an effective demonstration programme; and

(ii) giving free assistance to farmers by providing soil testing services and agronomic advice on the use of fertilisers and other related inputs in an integrated programme with the help of farm information services."[9]

It must be admitted that even the Sivaraman Committee did not go the whole way towards the concept of a total marketing system, in the modern sense of the term. The emphasis was still on distribution, though promotion was also recognised by the Committee as an essential part of the fertiliser marketing job, in the prevailing context of the country.

The new fertiliser policy:

The period that followed the Sivaraman Committee report witnessed a new fertiliser policy. This policy actually came out of the realisation that increased consumption of fertilisers held the key to large scale increase in food production. It was equally well realised that increasing the domestic capacity of fertiliser production without merely depending on imports is the surest way of increasing the availability of fertilisers to the farmers of the country.

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9. Ibid; p.77

The policy hitherto followed underwent a change so as to encourage the establishment of new fertiliser manufacturing units. It was decided to open up the fertiliser industry to the private sector - Indian and foreign. It was felt that otherwise, it would not be easy to expand the production capacity to the required measure in a short span of time. The decision to attract the private sector investment into the fertiliser industry had its natural consequences in marketing. The decision to open up the industry to private sector was followed by the grant of partial freedom of marketing to the manufacturers.

Components of the 'New Fertiliser policy':

The main components of this new fertiliser policy package were:

- Fertiliser will be accorded the priority status of a core industry
- Substantial fresh production capacity will be created in the country with a sense of urgency.
- Both public and private sectors, including foreign private capital will be encouraged to enter the field afresh or expand existing capacity.
- Fertiliser marketing will be liberalised in every respect. There will be progressive decontrol of fertiliser distribution, pricing and marketing.
- Private trade will be allowed to carry on aggressive marketing of fertilisers side by side with the cooperatives and other institutional channels.

- Fertiliser dealer licensing will be replaced by mere registration.
- Fertiliser promotion work will be organised on a massive scale and with a multiagency approach.

The most significant component of the new policy was, no doubt, the decontrol on fertiliser marketing.

The decontrol was planned to take shapte in stages. During the first year, 30 percent of the production could be taken for decontrolled and open marketing; during the second year 50 percent; from the third year onwards 70 percent to 100 percent of the domestic production could be taken for decontrolled and open marketing, subject to the proviso that government reserved the right to command and procure upto 30 percent of the product of any domestic producer for 'pooled marketing'. It was also envisaged that the domestic manufacturers could take the fertilisers wherever they wanted within the country and market them through the channels of their choice and at prices to be determined by them.

As a corollory to the above policy came the decision to abolish licencing of fertiliser dealers. The law obtaining until then had required every fertiliser outlet to apply and take a licence from the department of agriculture of the respective state government. The state governments were not very liberal in granting such licenses. The change permitted manufacturers to appoint any number of dealers wherever they deemed it necessary to do so, the sole formality to be complied with being to communicate for registration, particulars of the appointee to a designated official of the state government concerned.

This progressive measure had a very favourable impact on the development of fertiliser marketing. Not only in letter, but in spirit too, most of the state governments became liberal regarding the expansion of the fertiliser distribution machinery in the private sector. There was no longer the restrictive approach to the private trade nor the over protection of and exclusive dependence on the co-operative channels.

The new farming strategy:

It was during the same period that Indian agriculture witnessed the birth and adoption of the new farming technology based on high yielding crop varieties. These crop varieties were highly fertiliser responsive. With the introduction of the high yielding varieties, consumption of fertilisers was expected to shoot up dramatically.

This was the beginning of the Green Revolution.[10] This development had a great impact on fertiliser marketing in the country. The new agricultural strategy and the new fertiliser policy together determined the new course of fertiliser marketing. The six year period between 1965-66 and 1971-72 was one of spectacular achievements in expansion of fertiliser production capacities as well as in fertiliser consumption in the country. The installed capacity (of N + P) went up by 1.16 million M.T. in the six years, from 0.86 million M.T. in 1965-66 to 2.02 million M.T. in 1971-72. Fertiliser consumption (N+P+K) more than trebled, from 0.78 million M.T. in 1965-66 to 2.66 million M.T. in 1971-72. The number of fertiliser sales outlets in the country increased from 60000 in 1965-66 to 85395 in 1971-72.[11]

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10. Please see Chapter - 3, pp. 20-27

11. Fertiliser Statistics, The Fertiliser Association of India, New Delhi various issues.

It would be appropriate to describe the year 1966-67 as a 'watershed' year, an year that divides an earlier epoch of fertiliser 'distribution' from the current era of fertiliser 'marketing', in which a wide range of straight and complex fertilisers was offered for sale to the farming community, through modern, sophisticated and integrated marketing.systems.

However, within a short time, after the liberalisation of fertiliser marketing as explained above, the Government completely reversed the policy. The freedom of pricing was withdrawn. In fact, freedom of marketing and pricing, which was supposed to take place step by step was not even allowed to reach its last step. Before then, the policy was reversed. Consequent on the policy reversal, control was reimposed on the prices of the straight nitrogenous fertilisers viz. Urea, A/S, CAN and ASN, which together constituted 80 percent of the total fertilisers consumed in the country at that time. The relaxation in respect of distribution fortunately continued for some years. It was six years later that the distribution freedom was also taken away by bringing all fertiliser supplies under a supply plan coordinated by the Gov and notified statutorily under the ECA.

The relaxation regarding the licensing requirement for operating a fertiliser sales outlet was however not withdrawn, along with the withdrawal of price freedom and distribution freedom. The liberalised policy continues till today.

The third phase:

In the third phase, which is the current phase as well, fertiliser marketing in the country has assumed a very complex posture. Chemical fertiliser is no more a new product. The problems associated with new product marketing have vanished to a large extent. But the variety of fertiliser products has increased. So also has the number of competing manufacturers and brands. The market has assumed a new demand supply profile. Consolidation of fertiliser consumption has been the distinguishing feature of this phase of fertiliser marketing. The quick growth achieved in the mid-sixties could not be kept up. Instead, efforts were made to consolidate fertiliser consumption and maintain a reasonable growth rate.

There was a big quantum jump in both production and consumption of fertilisers during this phase. Fertiliser production (N + P) went up from 1.24 million M.T. to 4.09 million M.T. between 1971-72 and 1981-82; fertiliser consumption (N+P+K) went up from 2.66 million M.T. to 6.07 million M.T. The details in this regard were furnished earlier.[12]

This enormous jump in consumption and demand meant new types of challenges to the fertiliser manufacturing and marketing agencies. They have been trying out new experiments in physical distribution, channel design and sales promotion.

This phase has thus, been characterised by more sophisticated marketing. Competition among the different brands and increased availability of fertilisers in the country were the main factors that brought about a higher degree of sophistication in marketing in this phase. Different manufacturers were offering the same fertiliser product to the farmers under different brand names. There was not much difference among

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12. Please see Chapter-6, pp.74 and 83

the different brands of a given fertiliser product. The various firms had to develop and assign new and distinct appeals to their products. The product personality and the service rendered by the firms had to be played up. New services, new facilities and new concessions, improved packing, improved physical quality of the product and offer of other related inputs were used by the firms to give distinctive appeals to their brands which were otherwise not distinguishable from other brands. The firms also tried to motivate the distribution channels in the private as well as the cooperative sectors through a variety of incentives. This phase, in general, witnessed a transition - from generic promotion to brand promotion, from distribution to creative selling, from shortage to surplus, from co-existence to price war. Fertiliser marketing in the country thus saw the advent of a number of new comers into the field. Proven and established systems of distribution were getting shelved and new ones were designed in this place. The emphasis was on wooing the fertiliser dealer and to ensure his commitment and loyalty.

While greater freedom in marketing and distribution was made available to the industry, governmental regulation and control still persisted. The government continued to assume prime responsibility for the availability of the commodity as well as for various other aspects of marketing of the commodity. Though the role of the government as a regulator can be seen practically in every phase of the evolution of fertiliser marketing in the country, in certain respects it became more pronounced in the current phase. The social overtones of fertiliser marketing have been such that the government could not but intervene in the business and exercise control through various policy measures. The impact of these govermental policies on fertiliser marketing in India has been large. A new pricing system, totally overhauling the old pricing structure of the fertiliser industry, new policies on rail and road transport of fertilisers withe the objective of rationalising fertiliser distribution, new policy on fertiliser supplies to the interior village markets and stricter control on market zones of the various fertiliser firms have been some of the measures taken by the government in this phase. This was understandable. The relevance of a proper production and distribution system to the economic development of the country was so important that government had to step in continuously to regulate them. Moreover, having gone ahead with massive investment in chemical fertiliser production under the conviction that fertiliser is the most essential input in the farm package, the government could not look away in the matter of marketing and distribution of the commodity. With millions of tonnes of fertilisers available with the domestic manufacturers and import handling agencies, the government had necessarily to assume responsibility for ensuring increased fertiliser consumption.

Fertiliser marketing in India has today grown into one of the biggest businesses in the country, but it is still at the cross roads. The business has become much more competitive, but the consumer is still unsatisfied on different fronts, particularly with regard to price. The overall objective of the government to keep the prices of farm outputs down does not easily go with continuous escalation in the cost of production including the price of fertilisers.

It is in this context of developments that the bold contours of the fertiliser marketing system prevalent today in India have taken shape.

Impact of Government policies on fertiliser marketing in India:

The evolution of fertiliser marketing in India makes it clear that Government policies constitute the major influence on fertiliser marketing in the country. It will be no exaggeration to say that the fertiliser marketing system in India at any given point of time has been the product of the governmental policies in existence at the time. Sri F.J.Heredia describes this process in the following words:

> " 'Evolution' is an apt word for the process that have shaped the apparatus through which provisioning of fertilisers for India's agricultural communities is currently effected. The 'life force' powering this particular evolution is not the commercial equivalent of Darwinian 'natural selection' ; it is, in effect, Government policies that are mainly responsible for the characteristics of fertiliser marketing in India today."[13]

Government controls and regulations on fertiliser marketing exist in several countries of the world, especially the less developed ones. But, the impact of the government policies on fertiliser marketing is particularly significant in India. As Dr.Baijal says,

> "In most countries of the world, Government policies play a very important role in shaping the prospects of the fertiliser sector. Whether it is in the form of setting the prices of fertilisers or those of feedstocks, directing investment into fertiliser manufacture, operating a crop price support mechanism, developing fertiliser promotional programmes and organizing credit mechanisms, these policies have a determining influence on the manner in which the production of fertilisers as

13. Heredia, F.J ; Op.cit , P.I-1.

well as their off-take expand. This holds true with particular force for India in view of the substantial direct participation of Government in the fertiliser sector."[14].

There is no doubt that in India various policy decisions taken by the government at different points of time have determined the course of fertiliser marketing and shaped its institutional framework. Important among the government policies that have shaped fertiliser marketing are:-

(i) The policy that fertilisers will be marketed at a uniform price throught the country and that the maximum selling price will be controlled by the government and statutorily notified.

(ii) The policy that distribution of the fertilisers shall take place as determined by the government and statutorily notified under the Essential Commodities Act (ECA). As per this policy, specified quantities of specified fertiliser products will have to be made available by the manufacturer to specified states in each crop season.

(iii) The policy which prescribes the fair retention prices for the products for the manufacturer and the subsidies to which he is entitled.

(iv) The policy which prescribes the equated freight for the products for each manufacturer within which he has to manage the transportation of his fertilisers. If the manufacturer spends more than the prescribed equated freight, the excess will not be reimbursed to him by the government which administers the retention prices and subsidies.

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14. Baijal, Dr.S.S. ; Fertiliser policies and their impact on fertiliserproduction and consumption" in Development of Fertilisers in India, The Fertiliser Association of India, New Delhi , 1980, P.259.

(v) The policy which prescribes as a corollory to (iv) above, the mix of transport modes, ie the percentage share of rail and road, for moving the fertiliser from the factory to the marketing territories.

(vi) The policy which prescribes that all rail transportation of the products from the factory to the marketing territories shall be by full train loads consigned to a single destination from where the manufacturers shall take care of further dispersal of the stocks by road transport.

(vii) The policy which prescribes that specified distribution margins shall be payable to the channels of distribution in respect of each fertiliser product.

(viii) The policy that all fertilisers shall be delivered freight paid upto the block headquarters by the manufacturers.

In addition to the above mentioned policies on pricing, transportation and distribution, which directly impinge on the course of fertiliser marketing in the country, there are many other government policies which exercise indirect influence on it. Some of them are:-

- Industrial licencing policies
- Investment policy on fertilisers
- Policies on return on investment
- Feed stock policies
- Policies on choice of technology and scales of production
- Policies regarding agricultural output pricing and agricultural output targets.

Fertiliser marketing in the country had necessarily to operate within thegeneral frame-work of the government policies in all these areas. In the area of pricing, in particular, the fertiliser sector in the country had to totally conform to the directions of the government. As mentioned earlier, a feeble attempt to decontrol fertiliser prices was made in the country between 1966 and 1970, but was given up as inadvisable. Outside of this brief period, the fertiliser sector hasbeen under total control of the government in the area of pricing. And when the 'Marathe formula' on fertiliser pricing and return on investment was introduced in 1977, it became, by far, the most important and the most far-reaching example of the influence of government policies on the fertiliser marketing system in the country.[15] The Marathe formula has touched practically each and every aspect of the fertiliser business, not merely the pricing and marketing aspects.

Competitive marketing despite governmental controls.

A recognition of the overwhelming impact of government policies on fertiliser marketing in India should not however lead to the impression that fertiliser business in India is a noncompetitive business. The truth is far from this. Keen competition is a striking feature of the fertiliser business in India.

The domestic fertiliser manufacturers in India have always been allowed to play their marketing role, notwithstanding the government regulations on practically all the aspects of the fertiliser

15. A detailed description of the 'Marathe formula' on fertiliser pricing has been furnished in chapter - 8, pp.

business. The manufacturers have had freedom to develop their individual brands of fertilisers. They have had the freedom to compete with one another and develop their own systems of marketing and channels of distribution. In addition, competition has also been permitted between domestic fertilisers and imported fertilisers. As a result of this, fertiliser marketing in India presents almost a free enterprise scene, notwithstanding the governmental controls mentioned earlier.

The three main marketing models prevalent in <u>the fertiliser marketing system:</u>

The fertiliser business in India consists of three main parts, viz.,

(1) Imported fertilisers other than potassic fertilisers

(2) Potassic fertilisers

(3) Domestic fertilisers of various grades and types.

Each one of these parts has an associated marketing arrangement. Briefly, the marketing arrangements are as follows:

- All imported fertilisers except potassic fertilisers are marketed by the central fertiliser pool of the Government of India. The pool however has no marketing organisation of its own. It operates through the Food Corporation of India and a few domestic fertiliser firms who are nominated as the pool handling agencies.
- All potassic fertilisers are handled on an exclusive basis by the Indian Potash Ltd. (IPL), a public sector company.

- The domestic fertilisers are marketed independently by the respective fertiliser firms. Individual firms have their own systems of marketing and channels of distribution. Almost all the domestic fertilisers have incorporated both the cooperatives and the private trade in their respective marketing systems.

It must however be mentioned that though three distinct components as mentioned above are seen in fertiliser marketing in India, at the market level, ie, the wholesale and retail level all fertilisers, be they imported nonpotassic fertilisers, imported potassic fertilisers or indigenously manufactured fertilisers of different kinds, are marketed by the same agencies irrespective of the differences in the marketing arrangement followed at the apex level. Another striking feature is that at the market level, cooperatives as well as private trade share the job of fertiliser marketing in India almost as two equal halves of the system This is so, irrespective of, the type of marketing arrangements or the agency nominated for the job at the apex level.

Marketing model employed in the marketing
of imported fertilisers (non-potassic)

Tracing the history of fertiliser marketing in the country, it was mentioned earlier that the central fertiliser pool of the Government of India was created in 1944 and in the early years, the pool, as the name indicated, was pooling the domestic and imported fertilisers and was allocating them equitably to the various states.[16] The pool was actually taking over the domestic fertilisers and allotting them to the states at

16. Please refer page 129

pre-determined prices. It was also paying the domestic fertiliser firms their respective retention prices. As regards the imported fertilisers, the pool was allotting them to the states on the same lines as they allotted the domestic fertilisers, except for the difference that in the case of the imported fertilisers, there was no need for adjustments between allotment prices and retention prices.

When domestic production of fertilisers increased substantially in the sixties and the seventies, the domestic fertiliser industry started playing a leading role in the fertiliser marketing system in the country. The pool was satisfied with a secondary role. It abandoned the marketing of domestic fertilisers. Presently, the pool is in charge of the marketing of only the imported, nonpotassic fertilisers. But the role of government in coordinating the allotments to the states, however continues in respect of imported fertilisers as well as domestic fertilisers. The coordination in supplies is achieved by the government rhough a system of allocations under the Essential Commodities Act (ECA). This system is being explained in detail in page 158 in this chapter.

Between 1944, when the pool was created and 1968 when the Food Corporation of India (FCI) was created, the pool operated through the Regional Directorate of Food of the Ministry of Food and Agriculture. After the creation of FCI in 1968, the Regional Directorate of Food got merged with the FCI and the pool carried out its fertiliser handing and marketing operations through the FCI. This system continued for a full decade, till 1978. The FCI used to handle the fertiliser ships at the various

Indian ports on behalf of the pool, as the sole pool handling agency and despatch the fertilisers as per the instructions of the pool, to various places in the country in the account of the various states and other buyers/allottees of the fertilisers. Alternately, they despatched the fertilisers to the various buffer stocking points which usually meant the FCI godowns or the godowns of the Central and State Warehousing Corporations in upcountry. The stocks were subsequently distributed/sold as per the instructions of the pool. The FCI was suitably compensated by the pool for this handling job.

There was a change in the above mentioned system in 1976. To quote Sri B.P. Sikder,

> "During early 1976, the Government decided that the financing of the handling and distribution of imported fertilisers should be done by the banking sector and to that extent the pressure on the government budget would be less. In persuance of this decision, the handling and distribution of imported nonpotassic fertilisers were entrusted to Food Corporation of India on "ownership basis". Under this system, FCI would open L/Cs in favour of the Department of Agriculture while the ships are on high seas. They are given 60 days credit after which these L/Cs are encashed. Terms and conditions on which FCI have been handling imported nonpotassic fertilisers have also been mutually agreed to. On the basis of these terms and conditions, FCI have been doing this work on 'actuals' basis. Buffer stocking is also done by them on the basis of the guidelines given by the pool from time to time." [17]

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17. Sikder, B.P; "Handling and distribution of imported fertilisers in India", Fertiliser News July 1981, The Fertiliser Association of India, New Delhi , p.27.

The system of handling the imported fertilisers through the FCI was found wanting in some respects. In 1978, the Government of India decided to throw this job open to some of the domestic fertiliser units in the country who were willing to do it at a mutually agreed rate of compensation. In fact, even in the late sixties and early seventies, some of the domestic fertiliser units did handle substantial quantities of imported fertilisers. But that was on a seeding programme for facilitating the marketing of their eventual production of fertilisers. There is a difference between the distribution under the seeding programme in the early seventies and the large scale marketing of imported fertilisers by a number of domestic units in the late seventies under the banner of pool handling agencies. In the earlier case, FCI continued to handle the imported shipments and the seeding programme material was issued to the domestic units by FCI as allotments from the pool. But in the latter case, the pool handling agencies operated independantly replacing the FCI. The FCI also continued to do the handling job in a limited way but was reduced to the position of one among the several pool handling agencies.

The decision of the Government in 1978 to have several pool handling agencies instead of depending on the FCI as the sole pool handling agency was prompted by the considerations of costs as well as capacity limitations on the part of the FCI.[18] It was felt that the domestic manufacturers with their marketing infrastructure and marketing expertise

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18. Ibid.

were better equipped to aggressively market the imported fertilisers. Moreover the hands of the FCI were full with food procurement, administration of food buffer stocks and other activities.[19]

Presently, the following domestic fertiliser manufacturers operate as pool handling agencies in addition to FCI.[20]

1. Indian Potash Ltd.
2. Southern Petro Chemical Industries Corporation Ltd; (SPIC)
3. Mangalore Chemicals and Fertilisers (MCF)
4. Rashtriya Chemicals and Fertilisers (RCF)
5. Hindustan Fertiliser Corporation (HFC)*

With the introduction of the policy of marketing the imported fertilisers through the domestic fertiliser manufacturers, the role of FCI in this field understandably started shrinking. While FCI continues to be in the business, its share has come down to 40 percent in 1980-81 as against its earlier monopoly position in handling the non-potassic fertilisers. IPL and SPIC have taken up a big role as pool handling agencies. The agency-wise quantities of imported fertilisers handled during 1978-79, 1979-80 and 1980-81 are given in Table-1.

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19. Ibid.

20. Ibid; p.28

* Note: Some other firms also handled some quantities of imported fertilisers in a sporadic way. The **five firms mentioned here** regularly handle the imported fertilisers.

Table - 1

Agencywise quantity of imported nonpotassic fertilisers handled during 1978-79 to 1980-81.[21]

Qty. in terms of material
(in lakhs of M.T.)

Name of the agency	Qty. handled during 1978-79. Multi agency system started operating in October.	Qty. handled during 1979-80	Qty.handled during 1980 81.
F C I	24.70	17.07	15.31
I P L (Non-potassic) fertilisers alone)	2.02	7.48	10.14
S P I C	1.27	4.23	5.63
M C F	0.85	2.27	2.92
M F L	-	0.14	0.30
R C F	-	0.14	1.12
H F C	0.83	0.90	1.92
Others	29.67	32.23	37.34

For the sake of operational convenience, different agencies are assigned the lead roles in different specified ports. In marketing the quantities also, different agencies are assigned the lead roles in different states.

The imported fertilisers are transferred to the respective pool handling agencies on ownership basis. Accordingly they have to finance the marketing and handling operations. They are given 60 days credit facility. They are also given appropriate remuneration to cover the

21. Ibid.

Note: In addition, IPL handled 10.14 lakh tonnes of MOP and SOP.

handling expenses, freight, distribution margins and other marketing costs incurred by them in this process. The actual distribution of the stocks is coordinated by the Government of India through the ECA allocations and through instructions to the pool handling agencies.

The following features of the marketing system in respect of the imported fertilisers are worth noting:

(1) Imported fertilisers continue to form a sizable component of the total quantity of fertilisers marketed in the country every year, though, as a percentage to the total consumption, the imports are on a declining trend. Accordingly the pool and the pool handling agencies have a significant share in the total fertiliser marketing job in the country.

(2) The pool plays the role of a residual supplier. Accordingly, after the domestic fertilisers are fully allocated to the states, the residual requirements of the states, i.e. the deficits are registered with the pool. Thus, the imported fertilisers are marketed only in those states, where there are gaps between total requirements and total availability from domestic suppliers.

(3) The pool plays a major role as a buffer stock agency in fertiliser distribution in the country. It keeps adequate stocks in the buffer at any given time and plays a role similar to that of the food buffer system in price maintenance in rushing stocks to pockets of shortages and in guarding against future shortages.

(4) The buffer stocks maintained by the pool at any point of time is of the order of 2.5 million M.T. in the form of material. And

these buffer stocks are maintained at 650 centres spread all over the country, close to the consuming areas.* It would be apt to say that the major function of the pool is the management of the fertiliser buffer.

The marketing model employed in the marketing of potassic fertilisers:

The marketing system in respect of the potassic fertilisers is similar to, but somewhat different from the system adopted for the marketing of the other imported fertilisers which are commonly termed as the pool fertilisers. Whereas the nonpotassic imported fertilisers are marketed through several pool handling agencies and the FCI, the marketing of potassic fertilisers, i.e. M.O.P. and S.O.P is handled exclusively by the Indian Potash Ltd. Sri B.P. Sikder describes the marketing system for potassic fertilisers in the following words,

> "Prior to 1955, potassic fertilisers used to be imported by a number of companies in the private sector. In order to regulate the import of these fertilisers and to ensure equitable distribution on a rational basis throughout the country for stepping up the consumption of these fertilisers, the Ministry of Commerce and Industry established the Indian Potash Supply Agency as a consortium of potash importers and distributors. In 1957, the import of these fertilisers was entrusted to the State Trading Corporation of India, but the Indian Potash Supply Agency remained the sole distributor of potash in the country. These arrangements continued till the end of September, 1970. The Government reviewed the position in 1970 and decided to entrust the work of distribution and handling with

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* Ibid; p.30

> effect from October, 1970 of imported potassic fertilisers to M/s. Indian Potash Supply Agency on ownership basis. However, they were asked to broad base their share capital in such a way that cooperatives and public sector undertakings would have major percentage of the share of the company. In persuance of this directive, the company changed its name to Indian Potash Limited and also broad-based its share capital".[22]

The potassic fertilisers are sold to Indian Potash Limited on high seas by the government. The handling of ships and the distribution of these fertilisers are done by Indian Potash Limited on the basis of the instructions given by the government from time to time. And the government pays a suitable remuneration to the Indian Potash Ltd. for the handling and marketing of the potassic fertilisers.

<u>Marketing model employed in the marketing of domestic fertilisers:</u>

Domestic fertilisers is the largest among the three components of the fertiliser business. They are of various types and grades. They exclude potassic fertilisers as there are no indigenous sources of potassic fertilisers in the country. As mentioned earlier, domestic fertilisers are marketed by both cooperatives and private trade, since the marketing systems adopted by the cooperative channels and the private trade differ from one another, the marketing model employed by the domestic fertiliser firms is somewhat complex. It is an integration of both the marketing systems.

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22. Ibid; p.26

The marketing model in respect of the cooperatives is described below. The model in respect of the private trade will be described in the chapter on 'Distribution channels'.[23]

The marketing model used by the cooperatives:

The cooperatives play a vital role in marketing chemical fertilisers in India. Their share in fertiliser marketing has grown over the years, keeping in tune with the growth in fertiliser consumption in the country and the national policy of assigning them a commanding role ~~to them~~ in fertiliser marketing. They have more than doubled thei fertiliser business in the last twelve years, the increase being from 1.2 million M.T. in 1969-70 to 2.78 million M.T. in 1980-81 in terms of nutrients. In some states like Maharashtra and Gujarat three fourth of the total fertiliser business is accounted for by the Cooperatives.[24]

The cooperatives have several inherent strengths for doing fertiliser business. They have a very large network spread through the length and breadth of the country. They claim to cover 97 percent of the 528,000 villages in the country. They also claim a membership of 45 percent of all rural households.[25] About 43 percent of the total fertiliser sales outlets are in the cooperative sector.[26] Moreover,

23. Please refer chapter.12, pp

24. Hiremath, C.R; Marketing and distribution of fertilisers through cooperatives, paper presented at the training programme of the Fertiliser association of India, New Delhi, 1982. p.2

25. Ibid;

26. For details, please see chapter-12. p.

the state governments, channelise their agricultural credit facilities almost entirely through the cooperatives.

To quote Sri Hiremath again,

"In 1981-82, cooperative societies advanced short, medium and long term loans to the extent of Rs.2250 crores of which nearly Rs.900/- crores was for farm requisites comprising mainly of fertilisers".[27] The cooperatives are looked upon as farmers own outlets. While the quality of service provided by the cooperatives may not be ideal in all cases, the fact remains that the cooperatives safeguard the interests of the farmer.

The cooperatives enjoy another marketing advantage on account of their storage facilities - both field level storage facilities and buffer storage facilities. "The cooperative structure has a network of about 40,000 rural and 6,700 marketing godowns with an installed capacity of about 51 lakh tonnes which is largely used for stocking and sale of fertilisers." [28]

The cooperatives in the country have by and large adopted a three tier system of distribution for fertilisers. The standard marketing

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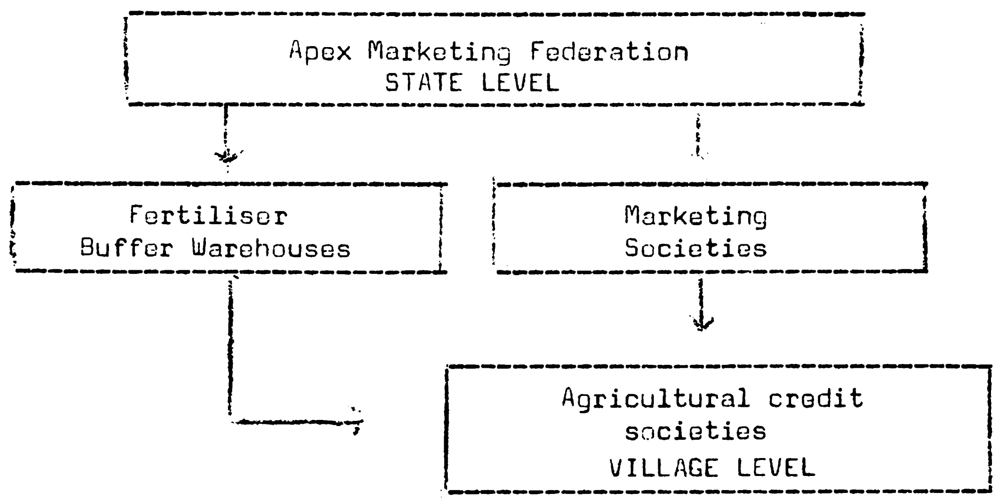
27. Hiremath, C.R; opcit; p.3
28. Ibid; p.4.

model prevalent in most of the states in the country is shown below:



In most of the states, the state level Apex Cooperative Federation functions as the centralised and sole purchaser of fertilisers in the cooperative sector from the various domestic manufacturers of fertilisers as well as from the pool and the pool handling agencies. The actual stock transactions, however, take place at the marketing society level or the regional buffer warehouse level. The Apex body monitors the supplies, pays for the stocks and monitors the subdistribution/marketing of the stocks through the different cooperative outlets.

In some states however, (Gujarat in an example) the cooperatives operate through a four **tier** distribution consisting of the apex level, district level, taluk level and village level cooperatives. In some other states (eg. Orisa and Haryana) only two tiers are involved in the distribution of fertilisers in the cooperative sector.

The cooperatives usually deal in all brands of fertilisers available in the state though they give different degrees of patronage to different manufacturers/brands due to a variety of considerations. The distribution margins payable to the cooperatives (the apex bodies) by the domestic fertiliser manufacturers have been determined and announced by the Government.[29] The government has also determined the terms of delivery - It is F.O.R./F.O.L block head quarters. If block level delivery cannot be effected the predetermined equated amount shall be payable by the manufacturer to the cooperatives in lieu of block level delivery. The terms of credit which the manufacturers extend to the cooperatives vary from state to state and from manufacturer to manufacturer and from product to product.

The coordinated fertiliser supply system:

Having discussed, the marketing models employed by each of the major components of the fertiliser business, it will be useful to get an idea of the mechanism used by the country for integrating the roles of the different components of the business and for arriving at a coordinated fertiliser distribution plan for the country as a whole and for each of the states/territories.

Fertiliser supply plans state-wise and sourcewise for the two agriculture seasons, Kharif and Rabi are finalised in bi-annual zonal conferences of representatives of Central Government, State Governments and the fertiliser firms. Import handling agencies, railways, warehousing corporations, the FAI and other agencies associated with fertiliser marketing also participate in these conferences. These conferences are held just prior to the commencement of each agriculture season

29. For details please see chapter 13, page

namely Kharif and Rabi, in January and July. They review the fertiliser situation and the requirements of each state and finalise a fertiliser supply plan statewise for the particular season. For this purpose, the state and union territories in the country have been grouped into four zones, as shown below:

Z o n e	Constituent states and union territories
East	Assam, Bihar, Orissa, West Bengal, Arunachal Pradesh, Manipur, Meghalaya, Nagaland, Tripura, Mizoram, Sikkim, Andaman & Nicobar and Tea Board.
North	Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab, Chandigarh, Delhi & Uttar Pradesh.
South	Andhra Pradesh, Karnataka, Kerala,, Tamilnadu, Pondicherry, Coffee Board, Rubber board and UPASI (United Planters Association of South India)
West	Gujarat, Maharashtra, Goa, Dadra, Nagar, Haveli, Madhya Pradesh and Rajasthan.

The first exercise in thisregard is the assessment of fertiliser demand for the ensuing crop season for each state. The requirements of plantation crops like tea and coffee are assessed separately. The demand projections are made by the respective state governments based on the broad criteria or parameters indicated by the Government of India. These projections are examined and refined by the ministry of agriculture of the Government of India. Finalisation of demand projection for the season is followed by an assessment of availability of fertilisers for the season from indigenous sources. Indigenous production availability is decided upon on the basis of the production estimates given by each domestic manufacturers for the season and as further refined by the ministry of chemicals & Fertilisers of the Government of India. The gap between demand and domestic supply is taken to be met through imports. Within this broad framework, the coordinated supply plan Statewise and Sourcewise for the season is finalised at the zonal conferences. Each manufacturing unit in the country gets its allocations to the different states, as a part of the coordinated supply plan.

In making the allocation of indigenous production under the ECA, the following principles are normally kept in view:-

1. No state should depend on a single manufacturer for its requirements.
2. No manufacturer should depend on a single state for his market.
3. The pool should act as a buffer stocking agency and a residual supplier.
4. Wasteful and criss cross movement of fertilisers should be avoided .
5. Marketing infrastructure built over the years by the manufacturers should be respected.

The supply plan thus decided for a season is accorded statutory recognition by the Ministry of Agriculture by notifying the plan under the Essential Commodities Act.

The zonal conferences also offer a platform for discussion and general review of various aspects of fertiliser distribution and consumption. The major areas of review and discussion are:

(a) Review of statewise consumption of fertilisers during the previous season.

(b) Review of supply performance, statewise and manufacturerwise for the previous season against the plan for the season.

(c) General review of agricultural and seasonal conditions and crop production.

(d) Fertiliser promotion efforts.

(e) Problems and prospects in respect of distribution infrastructure like transport, warehousing, retail outlets, etc.

(f) Port operations and handling of imported fertilisers

(g) Special programmes and policies of agricultural development, fertiliser distribution, promotion etc. proposed by the state and central governments.

(h) Fertiliser price situation

(i) Statewise estimation of consumption in the ensuing season

(j) Drawing up a coordinated supply plan for the ensuing season.

As a followup of the supply plan and to facilitate implementation of the supply plan finalised in the zonal conferences, coordinated quarterly transport plans are drawn up manufacturerwise at the quarterly meetings organised by the ministry of agriculture with the representatives of Indian Railways and manufacturers. These are fairly detailed plans of transport of fertilisers to different states/destinations as per the supply plans finalised in the zonal conferences.

Further, monthly or bimonthly review meetings are organised by the ministry of agriculture with the representatives of state governments, and manufacturers for monitoring the implementation of the supply plans ensuring a regular, across the table communication among the various agencies involved in the implementation of the plans.

The coordinated supply plan developed in the zonal conferences is by no means a perfect supply plan. It involves many distortions and compromises. Yet, this plan has served a useful purpose over the last nine years, ie eighteen crop seasons in regulating fertiliser distribution in India.

C H A P T E R - 8

FERTILISER PRICING

'PRICING' in respect of a sensitive and crucial commodity like fertilisers is no doubt, a difficult area for decision making. A number of mutually conflicting considerations has to go into the decisions on fertiliser pricing.

The prime consideration is no doubt the acceleration of agricultural production, especially food production, so that the nation can feed its growing population. And for realising this objective, the farmers of the country must have the required incentive either in the form of low input prices or in the form of high out-put prices. High out-put prices may push the food grains beyond the reach of the poorest sections of the population . It may also aggravate the overall inflationary pressures. So, the provision of the farm inputs at a reasonably low price, often remains a major objective of fertiliser pricing in India. At the same time, in an era of escalalating costs of production, the fertiliser producers have to be protected with fair prices for their fertiliser products. Infact, it is this need to meet the two equally essential but conflicting requirements that necessitates the subsidies that are extended to fertilisers by the Government. No doubt, the Government also tries to hike the prices of fertilisers periodically, offering at the same time a corresponding increase in the prices of farm out put so that a fairly attractive input - output price equation is available to the farmer without the subsidies going out of hand. But as stated earlier, if the price of the farm output is hiked too much, it may become counter productive,

This is the strategic predicament in fertiliser pricing in India. To quote Sri S.S. Baijal, "It is perhaps correct to say that the compulsion of fostering growth of fertiliser consumption on one hand and the need to assure a reasonable return on the ever-increasing investment required in fertiliser manufacture on the other, have posed a strategic predicament for the determination of fertiliser price policies the world over. India is no exception to this"

The main issues involved in fertiliser pricing

The process of achieving the two basic objectives mentioned above is admittedly difficult. And, ultimately, the Government has to meet the social over-heads involved in this process. The questions that always confront the fertiliser pricing decisions are:-

— What is the 'reasonable price' of food grains to the consumers in the country in a given context?

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1. Baijal S.S., "Fertiliser policies and their impact on fertiliser production and consumption" in ~~Dr. I (ed)~~ Development of Fertilisers in India, The Fertiliser Association of India New Delhi, 1980, p. 265.

— What is the 'reasonable price' the farmer should get for his farm produce in the given context?

— What is the 'reasonable price' that the farmer should pay for fertilisers in the given context?

— What is the 'reasonable price' the fertiliser manufacturers should get for their fertiliser products irrespective of the farmer - level prices of the fertilisers?

— Accepting the inevitability of state subsidy for bridging the gap between the 'reasonable price' at which the farm produce has to be offered to the ultimate consumers and the 'reasonable price' which the farmer should get how best the element of state subsidy could be allocated over:

(a) farm inputs pricing

(b) farm output pricing (procurement prices) and

(c) farm out put distribution costs.

India has always followed a policy of balancing the 'input prices' and the 'output prices', tackling both in a composite manner with the objective of accelerating the agricultural production. She has also followed a policy of mixed subsidies - subsidising partly the inputs, partly the output and partly the public distribution of the output.

To quote Sri Baijal again, "Any system of fertiliser prices is inextricably linked to the structure of farm output prices. As the Report of the Committee on Controls and Subsidies which was submitted in 1979 pointed out, the issue is not only that of the benefit-cost ratio arising out of fertiliser application to the farmers but also the national imperative of quickly raising the level of agricultural production in the country. Thus, it is essential that a long-term parity is targeted for achievement between fertiliser prices and the general level of agricultural prices." 2

<u>The Fertiliser Pricing System presently in vogue in India:</u>

While the foregoing paragraphs give an indication of the complexity involved in ~~pricing fertilisers and~~ relating fertiliser pricing with farm output pricing in India, there is another major complexity in ~~involved in~~ fertiliser pricing in India, that originates from the manufacturing side of the fertiliser business. India has a wide variety of fertiliser manufacturing units - units of different vintages, of widely differing capital costs, using different technologies and feed stocks. Their costs of production vary widely. But, as a matter of national policy, fertilisers are sold to the farmers at a uniform price.

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2. Ibid; p. 266

The fertiliser pricing system that is presently in vogue in India has come out of the recognition of these complexities. The pricing system is based on a formula where by each individual fertiliser manufacturing unit in the country is given a particular price that assures the unit's viable operation, while a general pooling arrangement yields a single equated price at the farmer level, for all units. The farmer level price is kept remunerative to the farmer just as the unit level price is kept remunerative to the manufacturing unit. The resulting gap is met by state subsidy.

We shall examine this Pricing System in a detailed manner.

<u>The Marathe Committee Report
and the retention price system:</u>

The Ministry of Chemicals and Fertilisers of the Government of India constituted in January, 1976 the "Fertiliser Price Committee" under the Chairmanship of Sri S.S. Marathe, Chairman Bureau of Industrial Costs and Prices to study the existing basis for the pricing of fertilisers and to recommend a rational pricing policy which would assure a fair return on investment on a sustained basis.

A number of compelling reasons prompted the Government to appoint this Committee.

In the wake of the unprecedented escalations in the OPEC prices of oil in 1974, and the continued uptrend in oil prices there afterwards, the entire economics of fertiliser production and distribution went hay Wire. Not only the feed stock prices went up enormously, the capital cost of fertiliser plants also went up steeply. Serious inhibitions developed in the free build up of fresh fertiliser production capacity. Simultaneously, the cost of imported fertilisers also went up considerably. The fertiliser Pricing System had necessarily to be overhauled. The foremost questions were:

— In the case of existing fertiliser manufacturing units, when their costs of production far exceed the statutorily fixed consumer prices of fertilisers, how do we compensate the manufacturing units?

— In the case of future manufacturing units, the cost of production is bound to be even more higher than that of the existing units because of the steep hike in the investment costs. What kind of a pricing formula will ensure a reasonable return to the future units and be equitable to all the units?

The answers to these questions were provided by the recommendations of the 'Marathe Committee' and the 'Retention Price System' for fertilisers introduced by the government following the acceptance of the Committee's recommendations.

The terms of reference of the committee were as follows:-[3]

(a) To evolve the norms for determining the production costs of the various fertiliser units including the return on capital which would make investment in the industry attractive.

(b) To suggest with due regard to the feed stock used, vintage of plants and other constraints to production, the retention prices for different units in operation and those likely to be commissioned during the 5th plan period which would give the requisite rate of return and also recommend a scheme of pooling for the operation of the retention prices concept.

(c) To examine the cost of feed stock and other major inputs at different fertiliser factories and suggest whether the prices of feed stock and inputs need to be rationalised.

(d) To suggest a formula for revision in the manufacturers ex-factory realisation, plant-wise, from time to time consequent upon any increase/decrease in the cost of the feed stock or in other major inputs.

(e) To evolve a policy for pricing of the imported fertilisers in relation to cost of imports, the nutrient content and the price of indigenous fertilisers of similar grades.

(f) To consider any other matter which may be related to or have a bearing on the issues mentioned above.

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3. Report of the Fertiliser Prices Committee, Government of India, New Delhi, 1977. (unpublished report)

The Committee gave its report in two parts:

Part I. dealt with pricing of nitrogenous fertilisers - Urea, Ammonium Sulphate and Calcium Ammonium Nitrate.

Part II dealt with the pricing of complex fertilisers and the marketing and distribution aspects of all fertilisers. Part II also dealt with the working of the 'Pool' which deals the imported fertilisers.

The Committee studied in detail the 'cost profile' of all the fertiliser units and found that the costs of production of the same fertiliser product vary widely among the different units in the country. The Committee found that such variations were due to a variety of reasons such as:- 4

- Differences in the Technology/Process employed.
- Differences in investment per unit of installed capacity of production and consequent differences in depreciation.
- Differences in the pattern of financing.
- Differences in 'Age' of the various units.
- Differences in the feed stock used.
- Differences in the extent of capacity utilisation.
- Differences in the location of the factories.
- Differences in the cost of Energy.

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4. Ibid.

The older units were generally low-investment units and the new ones, high-investment units. The high-investment units had to be protected against cost competition from the low-investment units. Ordering all the units to sell their fertilisers at a uniformly notified price, irrespective of their widely varying costs of investment and costs of production would have played havoc with the fortunes of the individual units. The committee highlighted this fact.

The Committee was also aware that, with the sharp escalation in capital costs involved in setting up new generation plants, these plants would not be viable at the prevailing selling prices of fertilisers. To attract invesemtnt for new capacity, it will be necessary to ensure an adequate net return. The committee recognised this requirement and felt that a fair return should be provided to each fertiliser unit taking into account, the unique features of each of the units, maintaining the consumer prices of fertilisers uniform. As regards the quanturm of fair return, the committee felt a post tax return of 12 percent on equity would be the ideal profit margin to the manufacturing units.[5] The committee provided for this in the fair ex-factory realisation fixed for each unit.

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5. Ibid.

The committee, however, avoided a simple cost plus formula of pricing. It recognised that a fair and viable pricing arrangement cannot wholly be dependant on actual costs, irrespective of whether or not such costs can be deemed as fair and reasonable in the particular context.

The committee also recognised that a high level of capacity utilisation is imperative for reducing costs of production and for earning reasonable returns in the case of a capital intensive industry like fertilisers. Some units in India had attained 90 percent or more capacity utilisation. Some were operating at around 80 percent of capacity. There were many others working at a much lower level. The committee did not intend to punish the units functioning efficiently and reward those functioning inefficiently. It, therefore, adopted for the purpose of cost calculations, a uniform capacity utilisation for all units, namely 80 percent of the installed capacity. The committee also stipulated the achievement of indicated consumption norms in respect of raw materials, energy, etc., as a condition for earning the normative rate of return.

After taking a definite stand on these issues, the committee addressed itself to the question as to what should be the fair realisation price, exworks, which would assure the manufacturing unit of 12 per cent post tax return on its net-worth at the level of 80 percent capacity utilisation, given the basic parameters of the unit and its consumption norms.

The committee determined the fair ex-works realisation price (retention price) separately for each unit. The retention prices fixed for each fertiliser unit with effect from 1-11-'77 onwards the day when the new system came into force, are shown in Appendix-XIII. 6 The prices have no doubt undergone many changes in the last five years. The prices fixed on 1-1-77 illustrates how the Marathe price formula was worked out and the wide variations among the different units in the fair retention prices fixed as per the formula. It can be seen that the retention prices for urea varied from Rs 948/- per M.T. in respect of Indian Farmers Fertiliser Co-operative Ltd, (I F F C O) to Rs 2,261/- per M.T. in respect of Neyveli Lignite Corporation (N L C).

The fairness of the committee's formula lies in the recognition that the determination of the fair retention price should be linked to a reasonable level of capacity utilisation plus conformity to the specified norms of consumption of raw materials. Through this formula, the committee introduced a basis which provides a rational frame work for investment decisions in the fertiliser industry and encourage managerial innovation and efficiency in fertiliser production.

The operation of the retention price system:

The Government of India accepted the main recommendations of the Marathe Committee and introduced a new pricing system for

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6. For details, please see Appendix-XIII Page

Note:- Since, to start with, the retention prices were fixed only for urea, Appendix - XIII gives the retention prices in respect of urea only.

fertilisers. The Government also created an institutional frame work - the Fertiliser Industry Coordination Committee (F.I.C.C.) for administering the new system. The new system came into being with effect from 1-11-1977 in the case of Nitrogenous fertilisers (Urea) and with effect from 2-2-1979 in the case of Phosphatic and complex fertilisers.

A clear idea of how the new pricing system was implemented by the Government can be had from the Gazette Notification issued by the Government on the subject. Relevant excerpts from the Notification of the Government of India dated 1-11-1977 are reproduced below:

"Government have decided to introduce a system of retention prices for units in the nitrogenous fertiliser industry with effect from 1st November, 1977. The system will be administered by a Fertiliser Industry Co-ordination Committee to be set up for this purpose and the Committee will operate a Fertiliser Price Fund Account for purposes of administering the system.

The system provides for a fair ex-factory retention price per tonne of Urea (hereinafter referred to as retention price) for each plant based on a capacity utilisation of 80 percent and a combination of norms and actuals in regard to the consumption of raw materials, utilities and other inputs, maintenance and other costs and provide for a post-tax return of 12% on net worth. The retention prices have been worked out on this basis by the Marathe

Committee for the period upto 31st March, 1979 for each of the 21 Urea manufacturing plants. Units whose retention prices, as fixed under this scheme, are, lower than the ex-factory price mentioned in para 3 will be required to credit the difference to the Fund Account referred to in paragraph I above in accordance with the procedural instruction to be issued for the purpose. Units whose retention prices under the scheme are higher than the ex-factory price will receive the difference from the Fund Account.

The Fertiliser Industry Co-ordination Committee was to function under the chairmanship of secretary (Chemicals and Fertilisers) and include Secretaries in the Ministries of Agriculture, Finance etc. There will also be representatives of the industry on the Committee. It was to have an Executive Director and his office was to be adequately staffed to maintain accounts, make and recover payments undertake costing and other technical functions, collect and analyse production data, costs and other information, review the retention prices periodically in consultation with the Bureau of Industrial Costs and Prices and make adjustments where necessary. The examination necessary for fixing retention prices for future pricing periods was also to be undertaken by the Committee.

These decisions come into effect from the 1st November 1977."[7]

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7. Government of India; Notification No. 166/24/77 FD (A) dt. 1-11-1977 of the Ministry of Chemicals and Fertilisers, Government of India; New Delhi, 1977.

Though the Marathe Committee report (Part I) dealt with all types of nitrogenous fertilisers, the Government of India decided to bring only Urea into the retention price system for the present and leave A.S. and CAN outside the retention price system. Even when the second part of the committee report covering the phosphatic and complex fertilisers was implemented with effect from 2-2-1979, A.S. and CAN continued to be outside the retention price scheme.

When the scheme was implemented in respect of Phosphatic and complex fertilisers, an adjustment was made first for the subsidy of Rs 1250/- M.T. of $P_2 O_5$ hither to provided for these fertilisers and retention prices and consumer prices were fixed after the adjustment. In other words, the benefit of retention prices for these fertilisers automatically displaced the earlier benefit of P205 subsidy. Whereas the earlier subsidy of Rs 1250/- per M.T. of P205 was available uniformly to all the units making these fertilisers, the retention price system conferred differential subsidies to individual units related to their respective costs of production and the formula pricing and formula return. Immediately following the implementation of this policy, on 2-2-1979, the subsidy on phosphatics and complexes varied from zero to Rs.3484/M.T. to the different units as against the previous dispensation of a uniform subsidy of Rs.1250/- per M.T. of P205 to all the units.

Understandably, with the implementation of the Part II of the report concerning the phosphatics and complexes, these fertilisers were also brought under statutory price control.

However, there are still a few types of fertilisers that are outside the retention price system. Some of them are decontrolled and others are subject to some form of price control, but outside of the retention price system. For the sake of clarity, we may mention that presently statutory price control operates on all fertilisers except:

(a) Ammonium Sulphate (A.S)

(b) Calcium Ammonium Nitrate (CAN)

(c) Fertiliser mixtures - powder and granulated

Ammonium Sulphate and C.A.N., are decontrolled in the matter of pricing. The pricing is done by the manufacturers based on cost factors and market factors. Retention prices are not applicable to them.

As regards fertiliser mixtures, the mixture manufacturers fix the prices based on the prices of the basic fertilisers that form the ingredients of the mixtures. The formula for this purpose was agreed to by the manufacturers and the respective state governments, years ago. Since the basic fertilisers which form the ingredients of fertiliser mixtures are covered by the retention price system, it can be taken that fertiliser mixtures in the country are also under the retention price system.

In other words Ammonium Sulphate and CAN are the only two fertilisers that are outside the retention price system.

These two fertilisers, put together form only a small slice of the total volume of fertilisers consumed in the country. A lion's share is accounted for by those fertilisers whose prices are controlled by the Government and which come under the retention price system. Even in respect of A.S. and CAN, proposal is pending with the Government to bring them under the retention price system so that the entire fertiliser industry of India, without exception will be under a uniform price system.

An objective analysis shows that in the matter of fertiliser pricing, the Government of India has been following by and large a pragmatic policy. It is aware of the limitations of a simple 'cost plus' pricing policy in a commodity like fertilisers. It is also aware that the fertiliser prices cannot be kept very low, unmindful of the 'costs'. It is trying to follow as a compromise, a 'cost plus' pricing policy the effect of which is partially mitigated by state subsidies. It is prepared to subsidise the fertilisers within reasonable limits so that the gap between 'fair price to the producer of fertilisers' and 'fair price to the consumer of fertilisers' is bridged. When costs escalate enormously, the Government recognises that the subsidies cannot match the cost escalations. It does not hesitate to increase the prices of fertilisers to the extent necessary even though price increases in fertilisers are unpalatable decisions.

When the prices of fertilisers are hiked, the fertiliser consumption in most cases tends to be somewhat depressed. The Government is pragmatic to initiate a variety of steps to offset the depression trend, whenever the prices of fertilisers are pushed up due to inevitable circumstances. Again, the Government does not fight shy of retracing the step if waranted by pragmatic considerations. There have been instances where the Government has brought down the fertiliser prices after watching the trends in consumption.

A ten year pattern of fertiliser prices in India has been shown in Appendix. XIV, p.392.

Fertiliser subsidies in India

From the foregoing analysis of the fertiliser pricing policy followed by India, it is evident that India believes in using fertiliser subsidies as an important policy instrument for achieving certain overall national objectives. Sustaining agricultural production and balancing the conflicting requirements of farm output pricing and farm input pricing are the chief objectives of fertiliser subsidies. Besides these two main objectives a number of other objectives are also sought to be achieved through fertiliser subsidies. The other objectives are supposed to lead to the two main objectives.

Objectives of
fertiliser subsidies:

The important ones among the many objectives that are sought to be realised through fertiliser subsidies are given below:

— To encourage adoption of modern and scientific agriculture.

— To bring new areas and new farmers and new crops into the fold of fertiliser use.

— To correct the imbalances in the consumption of different fertiliser nutrients.

— To ensure availability of fertilisers in all parts of the country, including the remote and inaccessible areas.

— To benefit the small farmers who do not have much of marketable surplus of farm produce and who therefore cannot benefit from an increase in the farm output prices; only input subsidies will help them in a tangible manner.

— To offer incentive for domestic production of fertilisers, by ensuring fair return on investment to the fertiliser industry.

— To support the maintenance of buffer stocks of fertilisers in the interest of uninterrupted agricultural production.

Types of fertiliser subsidies:

The fertiliser subsidies that are extended in India can be grouped into the following categories:-

- Subsidies extended to the domestic fertiliser units under the retention price system administered by the FICC. This component of the fertiliser subsidies forms the lion's share of the total subsidies on on fertilisers.
- Subsidies extended to the 'pool' on the marketing of the imported fertilisers, to cover the differential between consumer prices and the actual cost of imports plus distribution expenditure.
- Subsidies extended to specific target groups of farmers to meet specific requirements.
  - (a) Small and marginal farmers (S.F.D.A. Programme)
  - (b) Farmers in the drought affected areas or drought prone areas (D.P.A.P. Programme)
  - (c) Farmers in the tribal areas and hilly and inaccessable areas.
  - (d) Dry land farmers (I.D.A.D.A. Programme)

  The target group oriented subsidies are generally a limited kind of subsidies available to limited groups within specified financial limits.

- Subsidies given by some of the State Governments on specific fertiliser nutrients, with a view to promote a more balanced use of fertilisers.
- Freight subsidies on the transport of fertilisers depending upon exigencies.

The size of fertiliser subsidies :

The overall subsidies extended by the Central Government have been going up steadily. It went up from Rs.394 crores in 1973-74 to Rs. 1573 crores in 1978-79. The budget estimate for 1981-82 is Rs 2003 crores. The lion's share of the subsidies is accounted for by food and fertilisers. They are followed by export subsidies. The share of fertilisers in the total subsidies has been going up steadily in the last few years. It was 8.6% in 1977-78, 20.3% in 1978-79 and 28.6% in 1979-80 and 33.4% in 1981-82.

Until 1975-76, a major part of the fertiliser subsidies was granted to the imported fertilisers. From March 1977, substantial amounts of subsidies came to be granted to domestic phosphatic and complex fertilisers. In 1978-79, freight subsidy for road movement of fertilisers was extended since rail wagon availability was very inadequate. This was subsequently withdrawn. From November, 1977, the domestic nitrogenous fertilisers started receiving heavy subsidies since they came under the retention price system. From February 1979, the phosphatic and complex fertilisers also came under the retention price system and the subsidies on this category enhanced considerably, not withstanding the fact that the earlier P_2O_5 subsidies got replaced in the process. Throughout the 1970's, fertiliser subsidies in India have grown in size and importance. Details of subsidies on fertilisers provided by the Central Government and their percentage share to the total subsidies year by year between 1973-74 and 1981-82 are given in Table - 1.

TABLE - 1

Fertiliser subsidies given by the Central Government [8]

Year	Amount (Rs in crores)	As a % of the total subsidies provided by the Government
1973-74	33	8.4 %
1974-75	371	47.0 %
1975-76	242	34.0%
1976-77	112	10.4 %
1977-78	107	8.6 %
1978-79	319	20.3 %
1979-80	448	28.6 %
1980-81*	466	N.A.
1981-82*	679	33.4 %

* Budget estimates

8. Government of India, Report of the committee on controls and subsidies, New Delhi, 1979. P. 30

The break up of the fertiliser subsidies over the different items for the year 1979-80 are shown in Table - 2.

TABLE - 2.

Fertiliser subsidies in 1979-80 (Rs crores)[9]

Subsidy on Phosphatic fertilisers outside the retention price system	- 20
Subsidy related to the retention price system (all fertilisers put together)	- 245
Subsidy on the handling of imported fertilisers	- 145
Freight subsidy	- 38
Total fertiliser subsidy	448

In 1979-80, between food and fertiliser alone, subsidies to the tune of Rs.1000 crores were flowing out of the public exchequer. The Government of India and the Planning Commission became concerned about the growing proportions of subsidies under these heads. That is why the Government jacked up the consumer prices of fertilisers by 38% in June 1980 and by another 18% (over the already enhanced prices) in July 1981. Fertiliser subsidy in 1980-81 would have increased to Rs.1200 crores but for the 38% price hike in June 1980. And subsidy in 1981-82 would have increased to 1800 crores but for the 38% price hike in the previous year and another 18% price hiked in July 1981.

9. Ibid.

It will be evident from the facts detailed above that the nation is in a strategic dilemma in the matter of fertiliser pricing. The adverse implications of increasing the farm gate prices of fertilisers are weighing heavily on the one side. On the other side, the implications of ever escalating subsidies are equally disturbing. It is in this context that cost reduction in the fertiliser business assumes special significance. Manufacturing costs as well as marketing costs will have to be reduced, if fertiliser prices and subsidies have to be contained. In the next chapter, the need and scope for reducing marketing costs will be dealt with in detail.

CHAPTER - 9

FERTILISER TRANSPORT

Transportation is a major function in fertiliser marketing. The importance of transportation in fertiliser marketing was examined in brief in the chapter on 'The Fertiliser Marketing System'.[1] Transportation is also a major cost area in the fertiliser business.[2]

In view of its high importance in fertiliser marketing, transportation demands a detailed study.

The magnitude and complexity of fertiliser transport in India:

Fertiliser transport in India is a mammoth and complex job. A variety of factors ~~has~~ contribute to its magnitude and complexity. In the first place, fertiliser is a bulky commodity. The consumption of the commodity runs into millions of tonnes every year. It was seen earlier that there had been a handsome growth in fertiliser consumption in India in the last twenty years.[3] Growth in consumption has obviously involved growth in transportation. Between 1959-60 and 1979-80 the quantity of fertilisers transported in India grew from 1.8 million M.T. to 12.8 million M.T. - more than seven fold. Table-1 illustrates the growth in fertiliser transport.

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1. Please refer chapter - 7, p. 120
2. **This is discussed in detail below, pp.219-225**
3. Please refer chapter - 6, p. 83

TABLE - 1

Growth of fertiliser transport in India[4]

Year	Qty. of fertilisers transported - (million M.T.)
1959 - 60	1.8
1969 - 80	4.1
1976 - 77	9.0
1977 - 78	11.2
1978 - 79	12.4
1979 - 80	12.8
1980 - 81	
1984 - 85	23.0) Estimated
1989 - 90	33.0)

The sheer bulk makes fertiliser transport mammoth and complex. And the figures quoted as future consumption estimates clearly indicate that fertiliser transport in India is bound to be a continuously growing job.[5] Secondly, unlike some other commodities, fertilisers have to be transported to all the six lakhs villages in the country, spread over an area of one and a quarter million sq.miles and five thousand administrative blocks.

Thirdly, the consumption of the product is highly seasonal and time sensitive. There is no uniformity or continuity in consumption over the twelve months in the year. Consumption is restricted to a few months in the year. And a very large part of the total quantity is

4. Government of India, ministry of agriculture. (unpublished statistics)

5. Please refer chapter - 6, p. 107.

consumed during a few critical days before and after the sowing and transplantation of crops. Factors like monsoons greatly influence the critical days of fertiliser application. It was explained in chapter - 6 that fertiliser consumption varies widely between the two crop seasons of the country. - Kharif and Rabi.[6] Roughly 60% of the fertiliser off-take in an year is accounted for by the Rabi season and the remaining 40% by the Kharif season. In some states the pattern is even more skewed. It is in the ratio of 70:30. This means that a large share of the total quantity of fertilisers have to be made available in one crop season. This is an additional strain on the transport system.

While the consumption of fertilisers is so seasonal the production of fertilisers is continuous and uniformly spread over the year except when the fertiliser plants are shut down for maintenance. The imports of fertilisers are also fairly uniform throughout the year. The uniform production and imports has to be dovetailed with the seasonal pattern of consumption through an efficient system of transportation and warehousing.

In chapter - 6 it was also explained that the locations of most of the fertiliser units in the country have been chosen on the basis of closeness to raw material sources.[7] Such raw material based location rather than consumption or market based location has permanently saddled the transport system, with a long lead traffic pattern. Further more, due to techno-economic considerations, (economies of scale and optimum technology) each fertiliser unit has a large capacity.

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6. Please refer chapter - 6, p.
7. Ibid., p.81.

The transportation job would have been far easier if a much larger number of fertiliser factories, each producing considerably smaller quantities, had been established, throughout the country. The economies of scale did not permit this. It had instead necessitated the setting up of giant units in a few strategic locations. Infact, tomorrow's fertiliser units like Thalvaishat and Hazira projects will be five times as large as today's giants. Fertiliser transport from such locations in such quantities to the far flung consumption areas will understandably, pose a major challenge.

The locational imbalance i.e. the imbalance between production locations and consumption pockets is all the more acute in the case of complex fertilisers than Urea. The Urea factories are spread out relatively wider. But all the complex fertiliser units are located at the ports, the consideration being the economy and facility in handling the imported raw materials like sulphur, rockphosphate and phosphoric acid.

The locational imbalance, unfortunately applies as much to the imported fertilisers as it applies to the domestic fertilisers. In fact, the position is worse in the case of the imported fertilisers. The geographic position of the country is such that all ports are located in the Southern and the Eastern Zones, while large fertiliser consuming areas are in the Indo Gangetic plains in the North. The imported fertilisers usually travel a long distance because of this locational imbalance between ports and the main consumption areas.

Faulty planning in the movement and distribution of the imported fertilisers, worsens the position further.[8]

In addition to the imbalances arising out of the location of the domestic fertiliser units as well as the ports, there are also imbalances arising out of the product patterns of some of the units. The product pattern of these units do not match the demand patterns in areas contiguous to them.

Yet another problem feature of fertiliser transport in India is the concentration of fertiliser consumption in a few selected areas in the country. This was also explained in detail earlier.[9] The consumption is as much skewed geographically, as it is skewed seasonally. One third of the administrative districts in the country account for three-fourth of the fertiliser consumption in the country. The position may change slightly with batter market development work in the other districts. But, the broad pattern of some districts being very heavy consumers and others very low consumers of fertilisers may continue for years. This factor also adds to the complexity of fertiliser transport. Juxtaposed to the magnitude and complexity of fertiliser transport explained above is the capacity constraint in the transport system in India.

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8. This aspect is dealt with in detail below. Please see p. 242

9. Please refer chapter - 6. pp.99-103

The transport system
in India:

The transport system in the country is not adequately developed to meet the growing requirements of transport. Fertiliser is one of the commodities that suffers acutely from this capacity constraint. To understand the problems involved in this field, it is essential to have an overall idea of the transport system that is presently operating in the country. Since rail and road are the basic modes of transport relevant to the fertiliser cargo, it would be necessary to examine the two transport systems in some detail.

The rail transport system in India:

The railways of India is Asia's largest rail system and the world's fourth largest in terms of route k.m. It is also the second largest rail system in the world under a single management. Indian Railways is also the largest undertaking in India, with assets exceeding Rs. 6,000/- crores, annual revenue exceeding Rs. 2,000 crores and the number of employees exceeding 1.4 million, excluding 0.3 million casual labour. It is the nation's premier transportation agency carrying over 65 percent of the freight traffic and over 51 percent of the passenger traffic of the country.[10]

10. Pai, P.A; Movement of fertilisers by rail, Paper presented at the training programme of the Fertiliser Association of India at Madras, 1980, p.1.

Indian Railways is a multi-gauge system extending over 60,231 route kms. split equally between broad gauge (B.G.) and metre gauge (M.G.) with a small portion of narrow gauge (N.G.). Both the B.G. and M.G. systems extend to most parts of the country. Eight percent of the traffic is carried on B.G. The metre gauge largely works as a feeder line. The freight traffic carried by the railway has to be dealt with at 7,056 stations/goods sheds and through 97 break of gauge transhipment points. Over 95 percent of the goods handled are moving as full wagon loads. The rest of the five percent are handled as 'smalls'.[11] In 1978-79, the railways carried an originating freight traffic of 223 million M.T. It came down to 218 million M.T. in 1979-80. It is expected to carry 309 million M.T. of freight in 1984-85.[12]

All this may give the impression that the rail transport system in India is a strong system, equipped adequately to meet the transport needs of the country. But, in reality, the capacity of the rail transport system in India has not kept pace with the country's expanding requirements of transport. The inadequency of capacity, no doubt applies as much to the road transport system as it does to the rail transport system. But in as much as rail is a more massive component of the total transport system than road, the inadequacy of rail capacity appears graver. To quote from the report of the National Transport.

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11. Ibid.

12. Planning commission, Government of India, Sixth Five Year Plan, 1980-85, New Delhi. pp. 299-300

Policy Committee (NTPC):

> " Despite continuous efforts made since 1951 to augment the capacity of various modes of transport, the transport sector has generally experienced bottlenecks and capacity of transport facilities has adversely affected the smooth functioning of the economy. During the last decade, in particular, the growth of transport capacity lagged behind requirements of the economy, so much so that difficulties and problems arose in almost every part of the country in regard to movement of essential commodities needed for industrial and agricultural development and for meeting consumer needs of the community."[13]

In the case of fertilisers, the infrastructural shortage has been of a critical nature. For example in the ten years between 1968-69 and 1978-79 the consumption of fertilisers grew at the rate of 19 percent per annum.[14] But the total freight traffic of the railways grew only at 9.5 percent per annum.[15] Taking a recent period of four years between 1975-76 and 1979-80 it can be seen that whereas total fertiliser transport rose by 20 percent per annum fertiliser transport by rail rose only by 13.9 percent.[16]

The total demand on rail transport has been estimated to be at about 309 million M.T. of originating traffic in 1984-85, the terminal year of the Sixth Five Year plan. In terms of transport effort, this is expected to account for 220 billion K.M.[17]

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13. Planning Commission, Government of India, Report of the National Transport Policy Committee, New Delhi,1980.p.21

14. Please refer chapter-6, p.83

15. Sixth Five Year Plan 1980-85, op.cit; p.299.

16. Verma N.P. Op.cit; p. 24.

17. Sixth Five Year Plan 1980-85, op.cit; p.300

It appears that even the modest rate of growth envisaged in the Sixth Five Year Plan may not be actually realised during the plan period. Resources constraint is the main impediment in realising the targetted level of transport capacity. The railways require massive and urgent investment for carrying out the required expansion and modernisation. They sought an investment of Rs. 10,000 crores in the Sixth Five Year Plan. But the Plan has provided a total outlay of only Rs. 5,100 crores to the railways. Out of this, Rs. 2,100 crores has been provided for adding rolling stock. This provision is quite inadequate.

The working group set up by the Planning Commission to prepare the resources arithmetic for the railways had stated that the demand for wagons by the end of the Sixth Plan for a target traffic of 309 million tonnes will be around 260,000 wagons. However, while finalising the Plan, the Planning Commission fixed the requirement at one lakh wagons only. It also stated that the entire demand of wagons should be met through the indigenous sources and no imports of wagons should be allowed.[16]

Apart from resources constraint, the rail transport system in India also suffers from low productivity and other problems. These are examined in some more detail later.

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16. The Economic Times, Bombay dated 21-2-1982, p.5.

The Road Transport System in India:

Road transport is as important a component as rail in the total transport system in India though it may not be as massive as rail transport. Some of the functions performed by road transport are irreplaceable by rail or any other mode of transport. In particular, it plays a crucial role in reaching the interior parts of the country.

In the last 30 years, road transport in India has grown considerably, despite various constraints including the oil crisis. Between 1951 and 1978, road transport of freight in India expanded from 5.5 billion tonne K.M. to 77 billion tonne K.M.[19] The increase was nearly twenty fold. Actually during this period, the rate of increase in road traffic has been considerably larger than that in rail traffic. Over a period of thirty years, total transport in the country (rail and road combined) did not register even one third of the growth rate that was registered by road transport alone.[20] Yet, the road transport system is unable to meet in full measure the demands placed on it.

By 1975-76, India had a total road length of more than 1.4 million K.M. It was less than 0.4 million K.M. in 1951 out of the net work of 1.4.

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19. Report of the NTPC, op.cit; p. 366.

20 Ibid;

million K.M. roughly 40 percent is surfaced. The national highways constitute nearly 29,000 K.M. and the state highways nearly one lakh K.M.[21] The fact that India has a road net work of more than 1.4 million K.M. may be a matter for some gratification. But it has got to be recognised that the network is thoroughly inadequate to meet the transport requirements of this vast country. And the quality of the roads is quite poor. The increase in the network of national highways is particularly inadequate. The national highways network constitutes hardly six percent of the total surfaced road length in the country, though the former carries over 25 percent of the total road transport load. Whereas, the total road network in the country went up from 0.7 million K.M. to 1.4 million K.M. between 1961 and 1975, the increase in the national highways network in the same period was a meagre 5540 K.M.[22]

A major gap in India's road system is in respect of rural linkages from the nearest national and state highways. And rural roads are of special significance to fertiliser transport. As on 31-3-1978, as against a total number of 5.76 lakh villages in the country only 1.69 lakh villages or 29 percent of the total had all-weather roads. Another 93,000 villages or 16 percent had fair weather roads. The total length of rural roads as on 31-3-1978 was roughly 5 lakh K.M.[23]

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21. Ibid; p. 15

22. Ibid; p.371

23. Ibid; p.181

The details of growth in truck availability in the country over the years are presented in Table - 2.

TABLE - 2

Growth in Truck availability[24]

Year	No. of goods vehicles registered in India
1950-61	81,888
1960-61	1,67,649
1970-71	3,42,577
1975-76	3,44,093
1976-77	3,67,202
1977-78	3,68,193

The sixth Five Year Plan (1980-85) has provided the following outlay for road transport:-[25]

Road net work	-	Rs.3440 crores
Road transport	-	Rs.1200 "
Total		Rs.4640 crores

The auto industry of India is poised for big growth in this plan period. By the end of the Plan, the production of vehicles (all auto vehicles out together) is targetted to go upto one million per annum Not only will the volume of production of vehicles go up but there will also be some technological upgradition of the vehicles.

24. Ibid; p.184

25. Sixth Five Year Plan 1980-85; op.cit; p.311

Notwithstanding the growth that has taken place in the production of trucks in India in the last thirty years, India compares poorly with other countries of the world in the matter of number of trucks per unit length of surfaced road. India needs conscious and urgent efforts for increasing the availability of trucks in the country. It also needs a continuous programme for modernisation of the fleet.

The share of rail and road in
fertiliser transport in India:

Rail and road together account for 99 percent of the total quantity of fertilisers moved in India. Coastal shipping and inland water transport together account for less than 1% of the total quantity moved. The details of the share of rail, road and coastal shipping in fertiliser transport during a period of five years from 1976-77 are given in Table-3 below.

TABLE - 3

Intermodal mix of fertiliser movement in India.[26]

Year	Qty. of fertiliser transported in million M.T.				Percentage share		
	Rail	Road	Coastal shipping	Total	Rail	Road	Coastal shipping
1976 - 77	7.8	1.2	Negligible	9.00	87.0	13.0	Negligible
1977 - 78	9.3	1.9	Negligible	11.20	83.0	17.0	Negligible
1978 - 79	8.6	3.8	0.04	12.44	69.2	30.5	0.3
1979 - 80	8.2	4.6	0.07	12.87	63.7	35.7	0.6
1980 - 81	8.1	5.63	0.07	13.80	58.8	40.8	0.4

26 Narain Shanti; Transportation of Fertilisers. Paper presented at the training programme of The Fertiliser Association of India, New Delhi, March, 1982.p.2

Traditionally, rail-road movement of fertilisers had been around 85:15. In 1978-79 there was an abrupt change in the pettern since availability of rail wagons became extremely critical. The road share went up steeply to 30 percent in 1978-79 from 17 percent in 1977-78 and the share of rail dipped to 69 percent from percent. This trend continued in 1979-80. The road share went up to 36 percent and the rail share came down to 64 percent because of the subsidy extended by the government to road movement of fertilisers .[27] In 1980-81, the share of rail touched the all time low at 58.8 percent and the share of road reached the all time high at 40.8 percent. This trend was however reversed in 1981-82, when railways implemented the new policy of moving fertilisers by unit trains and made all out efforts to improve their freight traffic capability.[28]

Rail vs. Road comparison of merits and demerits:

The two main modes of transports, viz. rail and road have their associated merits and demerits from the view point of the user.

Rail enables large scale movement at a stretch. A quantity of 1500 to 2200 M.T. gets pulled out in one unit train. This advantage is not available in truck transport. In truck transport, a unit despatch usually consists of 10 M.T. to 13 M.T. only. As many as 160 trucks will have to be lined up for hauling the same quantity which a single unit train can haul up.

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27. For more details please see pp. 205 - 207

28 For more details please see pp. 208 - 218

Rail freight rates are telescopic. Cost per tonne per K.M. by rail works out much lesser for long distance haulage. Road transport does not provide telescopic rates. The difference between rail freight and road freight keeps on widening as the distance range keeps moving up. Rail tariff also involves differential and concessional rates depending on the commodity carried. For fertilisers, rail freight rates are concessional. In the case of road, the freight rates are uniform for all commodities.

Again, the freight rates in the case of rail are relatively more stable over time. They do not fluctuate easily. In the case of road, the market rates vary widely, season to season and even day to day. Absence of return loads does not influence the rail freight. Irrespective of direction or destination, rail freight rates remain uniform, unlike the rates of road transport.

The cargo that is entrusted to rail transport is secured since the railways are a government undertaking. In the case of road transport, suitable guarantees will have to be taken from the carriers as security for the stocks entrusted to them.

Also, planning of movement of large quantities can be done in advance in the case of rail by suitable liasion with the railways. In the case of road, usually planning can be done only on the basis of day to day or week to week availability of trucks.

In contrast, road transport has also a number of merits. The roadways have much more extensive net work throughout the country than the railways. The net work of roadways works out to 29 k.m.

for every 100 sq. k.m. of land, whereas the rail net work is only 1.74 k.m. for every 100 sq. k.m.[29] Roadways have also greater flexibility in the matter of route accessability. They can, unlike the railways, reach every nook and corner of the country. The railways are restricted in their routes limited by the permanent way as well as by the break of gauge/transhipment. Road does not have such problems. Out of total of five thousand administrative blocks in India, more than 2900 blocks, nearly 60 percent of the total, do not have any rail head. In reaching such interior blocks, road transpot has a preeminent role. And for reaching hilly areas in the country, road is the only mode of transport that can be thought of. Deeper penetration of the market and servicing of the retail outlets in the interior parts is an essential requirement of fertiliser marketing. Road transport fits this requirement very well.

Road transport also facilitates despatches of fertilisers in smaller lots. On the other hand, especially after the switch over from wagon load movement to block rake movement, the unit consignment by rail is in the order of 1,600 tonnes to 2,200 tonnes bound for a single destination. The users prefer, for a variety of commercial and infrastructural reasons, to move the goods in smaller unit volume wherever the choice is available.

Secondary transport of fertilisers, as a rule, takes place by road. Road has to be resorted to for breaking the bulk and taking the goods in small assortments to scattered places. In other words,

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29. Derived from area of the country and the route length of rail and road network.

whatever be the mode of primary transport, the culmination of transport has to be necessarily by road, by trucks or by bullock carts.

Even in respect of primary transport, for short and medium distances road often works out cheaper than rail transport on a 'total cost approach'. This is so because, road transport can take the goods from point to point without involving double handling. Terminal handling costs can be either avoided in toto or be kept minimal in the case of road transport. Rail transport on the other hand involves double handling. For short and medium distances, the total transport costs usually work out cheaper in respect of road, compared to rail, mainly on account of the savings in the terminal costs.

The variation between rail and road in the matter of terminal costs assumes added significance in the context of the new policy of limiting the rail movement to a few rake receiving points in full train loads.[30] When road bridging over long distance has to be undertaken from the rake receiving railheads, the terminal costs become all the more significant.

Road transport also enables the reduction of inventory costs and simultaneously improves the customer service level. This is because the transit time is reduced considerably when the cargo is moved by road. By reducing the inventory requirement, road also facilitates more efficient and equitable distribution of available fertilisers under conditions of high demand and inadequate supply. The available supplies could be stretched to a larger number of distributors by road since supplies by road take place in small lots.

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30. For details of this policy please refer pp.208-215 below.

Even when costs are marginally higher, road transport is often preferred and will continue to be preferred in view of its better user orientation as compared with rail. The quickness of delivery, the smallness of the unit consignment and the door delivery facility are not the only plus points of road. There are many more.

Transit losses are usually negligible in road movement; in any case, far lesser compared to rail. The procedures for getting the transit losses settled are also relatively easier and less cumbersome.

Yet another incidental advantage of road transport is that as the number of handlings are limited in the case of road, the damage to the product and the package is least when goods are transported by road.

Again, packaging specifications are not as strict in thecase of road, as in the case of rail. The procedures of despatch are also relatively simpler in road movement. Rail involves cumbersome despatch procedures. Even calculations of freight are cumbersome in the case of rail; it is quite simple in the case of road.

Roadways are not a monopoly industry like the railways. As such, competitive freight rates are available when one chooses to move by road. A choice can be made out of the several available offers based on cost considerations as well as considerations of the quality of service provided.

Further more, the railways sometimes refuse consignments to certain destinations because of route restrictions. The cargo does not move to places where it is required. It moves, instead, to places where the railways can and want to take it at the given moment. On some other occasions, the goods are moved where they are required but by a circuitous route, again because of the railways' operational problems. And the consignors have to meet the additional expenditure. In the case of road transport, the problem of route restriction and congestion does not normally arise.

Impact of some of the recent government policies on fertiliser transport:

Government policies affect fertiliser transport in the country in a significant manner. Among the policies introduced by the government in the recent past, the following have left a special impact on fertiliser transport.

(i) The policy of 'road subsidy'
(ii) The policy of movement by unit trains/block rakes
(iii) The policy of delivering fertilisers at block level
(iv) Substantial hike in rail freight for fertiliser cargo.

(i) The Road Subsidy Scheme:[31]

From 1976-77 onwards inadequate rail wagon availability became a serious problem for the fertiliser cargo. The volume of fertiliser traffic went up still further in the next two years, without the capacity and productivity of the railways keeping pace with the steep expansion of the fertiliser traffic. In 1978-79, fertiliser movement by rail suffered a serious setback in almost all the regions of the country. In some cases, wagon supply dropped to fifty percent of the previous year's level. Increased production of fertilisers in some units, increased imports of fertilisers into the country, competing demands

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31. This section is based on an article published earlier by the research scholar. Please refer Ramaswamy V.S. "Fertiliser transport - Railways should do the job removing road subsidies", The Economic Times, Bombay dt.24-4-1979 & 25-4-1979 p.5 in both.

on the available wagons from imported shipments of other materials like cement, coking coal etc., were to some extent responsible for the wagon crisis. The main reason for the crisis however, was a significant decline in the productivity and efficiency of the railways.

In the latter half of the financial year 1978-79, the Government of India got reconciled to the fact that the railways will not be in a position to move the stocks of fertilisers accumulating at the ports and the domestic fertiliser factories. The Government brought in a scheme of subsidy for the road movement of fertilisers so that road transport can relieve the strain on the railways. The Government had to resort to this unwelcome measure because of two reasons. Production of fertilisers in the factories in the country had to be kept going. It would be suicidal to sacrifice fertiliser production merely because of the transport bottleneck. A break down in the production of fertilisers would have seriously hampered agricultural production. Moving the stocks by road was the only alternative. But the fertiliser manufacturers were not in a position to move the stocks by road without a subsidy from the Government. As per this scheme, subject to certain conditions, the difference in the cost of road movement and rail movement was to be reimbursed by the government to the manufacturer. The cost of road bridging at the loading as well as unloading end was also to be reimbursed.

The subsidy scheme pushed up the share of road in fertiliser movement considerably. The stocks had to be somehow cleared out of the factories and ports. And, here was an opportunity and incentive to move the stocks by road at somebody else's cost.

The road subsidy scheme was a direct result of the railways' failure in moving the fertiliser cargo. To that extent it was wasteful. It could at best serve only as a stop-gap arrangement. The scheme had no chance of serving as the durable remedy for the problem, though it provided some temporary relief at a high cost to the nation. In the first place, conceptually, the scheme was erroneous. The concept that road could replace rail, in respect of the primary movement of a bulk cargo like fertiliser is primafacie unacceptable because of the high cost involved to the user and the economy. Secondly, the scheme amounted to an admission on the part of the railways that they were incapable of moving this essential commodity. This was full of serious implications to the national economy. Instead of raising the question as to why the railways could not perform, the non-performance was accepted and an expedient solution, involving a large drain on public resources, was introduced.

Apart from the additional cost involved, road movement could not adequately fill the gap created by the falling levels in rail movement. Getting enough lorries to make up for the shortfall in wagon supply was not easy. Further, because of the subsidy scheme, the truck freight rates went up considerably. It was a question of too much money chasing too few trucks. The availability of trucks after all did not go up merely because the government introduced the road subsidy scheme for fertiliser movement.

Fortunately, after two years, the scheme of road subsidy was withdrawn. In the meanwhile there was some marked improvement in the railways' capacity for hauling the fertiliser traffic. Though this involved certain changes in the system of movement and certain additional costs to the user, it was a welcome relief. The changes introduced by the railways in the system of fertiliser movement is discussed in the next section.

(ii) Movement of fertilisers by unit trains (or block rakes)

Seized with the growing complexity of transporting the fertiliser cargo, the government and the railways had to consider a number of innovations in movement. The road subsidy scheme discussed earlier was one such innovation. It was noted that the scheme failed to serve as a lasting solution. The other arrangement that was introduced in 1979-80, restricted rail movement of fertilisers to full train loads, moving on point to point basis, from originating railhead to destination railhead as a block rake.

The new arrangement was justified on the following grounds:-

— It confers several benefits on the railways.

— The railways' operational system is such that the utilisation of its rolling stock improves considerably when goods are hauled in block rakes from point to point. When the haulage takes place in this manner the railways are able to improve the turn around of the wagons and carry more traffic with a given fleet of wagons. The rolling stock on the railways are specially geared for such a point to point train load movement.

- When movement takes place in block rakes, point to point, there is considerable savings for the railways. It has been found that as much as 30 percent savings in resource costs is possible when movement takes place in this manner, as compared with movement in piecemeal to several destinations.[32]

- Marshalling of the wagons at the marshalling yards en route is eliminated totally when the goods move in full train loads directly from the originating station to the terminating station. The transit time is cut drastically and the goods are delivered with great speed. The railways are also able to monitor the stocks better and minimise the damages to the stocks in transit.

- Closed circuit block rakes running to gauge terminals would also avoid the transhipment bottlenecks.

- In general, railway assets are utilised most productively, when haulage takes place in block rakes.

- Fertiliser is a commodity that lends itself admirably for movement in this manner.

- The railways just do not have the capacity to move the growing volume of the fertiliser cargo, if movement takes place in piecemeal. There is a limit to which the rolling stock could be expanded in the short run. Even assuming that there is no investment constraint or wagon production constraint, the railway system cannot take additional wagons beyond a point. Increasing the turn around of a given quota

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32. This is discussed in more detail below pp.231-233

of wagons through block movement is the only answer to cope with the increasing demand for transport. Therefore, fertiliser transport by rail has to be in block rakes.

Sri N.P. Varma explains the situation in the following words:

" It would be, at this stage, relevant to consider the pecularities of the railsystem. Its rolling stock utilisation improves in geometric progression with every rise in the proportion of train load operation to total freight operation. The traffic is capitive, the turnround low, (as the train load skips marshalling yards) and the stream steady. The incidence of rake disturbance is minimal. There is assurance of full haulage capacity utilisation. What is true of the world railways as a system is true even to a larger extent of the Indian railways. Estimates indicate that 80 percent of its fleet lends itself of train load operation. Nowhere in the world except in the U.S.S.R. such a situation exists. Exploitation of this advantageous situation holds key to the improvement of the troubled Indian rail road industry."[33]

The railways were convinced that movement by block rakes will improve and this is the only way to improve in the immediate period, the carrying capacity with the given rolling stock and other resources. They, accordingly selected and notified a list of railheads (sidings) capable of receiving full train loads. The railways periodically update this list in the light of developments that take place. There are 165 such railheads at present.[34] They are to serve

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33. Varma, N.P; "Problems and prospects of adopting nodal point concept in fertiliser distribution", Fertiliser News December 1980, The Fertiliser Association of India, New Delhi; p.68

34. The Fertiliser Association of India (FAI) communication No.ES/5.1 dated 16-4-1981, New Delhi.

as terminal points for the block rakes, from where road bridging will take place to the destinations where the fertilisers are to be stored for further distribution/consumption. And as a concomitant of the new policy, the piecemeal movement by wagon loads to all and sundry railheads was sought to be totally eliminated or restricted to the barest minimum.

The system of block rake movement has a number of demerits from the user's point of view. In the past, rail wagons used to carry fertilisers to any rail head in the country as desired by the fertiliser manufacturers. They numbered 7056 railheads in all.[35] It was predominantly a one car operation, moving from anywhere to anywhere, largely on the pattern of truck operation.[36] With the block rake movement, this facility of reaching each rail head in the country through a direct and single stage rail movement has been taken away. Fertilisers, hence forth was to move by rail only to the specially nominated 170 railheads and not to anyone of the 7056 rail heads as before. It would move only in full train loads from destination to destination, in one block. The first implication of this is that a Second Stage Movement becomes necessary for carrying the cargo to the desired destinations from the rake destinations to which the railways take them. And the Second Stage Movement can only be by road which is more expensive and energy intensive. Such second stage movement may involve even back transport

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35. Pai, P.A; op.cit; p.2

36. Verma N.P., op.cit; p.68

from the rake railhead to the desired destination. If the manufacturers want to use rail, they have to suffer the handicaps arising out of this policy. They also have to necessarily send 1600 M.T. to 2200 M.T. of their products to one single destination that is nominated as the rake receiving railhead by the railways whether demand of this level exists or not in and around that railhead. And from there, they have to disperse the rake load of stocks by road to various places where the stocks are needed. Such places may be even 200 and 300 kms. away from the rake rail head. Not only do all these factors make the job more complex but the net effect of these can be one of increased dependence on road in the form of road bridging from the rake rail heads. Thus, there seems to be some in built drawback in the policy of movement by block rakes.

Operationally, the policy of block rake movement has faced and is still facing several constraints. A majority of these constraints arise on account of lack of adequate infrastructural facilities at the originating points as well as at the destinations. Loading, unloading and handling operations are strained to the maximum. Trainload operation requires certain investments at both the loading and unloading terminals. Setting up of unloading terminals is particularly capital intensive since at a number of receiving rail heads, such facilities have to be created. Presently, even the few selected railheads that are described as rake receiving railheads do not have adequate facilities to handle full rakes. When a bunching of rakes takes place, the difficulties are compounded further. The sidings are not adequate for the placement of all the wagons at a time. Moreover, covered platforms are not available at a number of places for the handling of the wagons during rainy weather. Usually, under the block rake policy, the quantity involved is 1600 M.T. to 2,200 M.T. The railways allow only five to nine hours free time, depending on the size of the rake, for unloading the rakes at the receiving railheads. Because of the infrastructural constrains, most often, it becomes difficult to cope with this time limit for clearance.

To quote Sri N.P. Verma, again,

> " These so-called "rake handling points" do not have the necessary facilities which are required for handling a trainload with reasonable efficiency, speed and without loss of material. Some of these points cannot even physically accommodate a rake. None of these have even minimum infrastructural facilities. Unloading cannot take place during inclement weather. Some tell-tale photographs appearing in the dailies depicting extensive damage to fertilisers on account of rain are no mere exaggerations. Worst, in many cases, fertilisers get unloaded where trucks cannot reach on account of approaches being under deep water or cluttered up with extensive pits. The situation is exasperating. To the receiver, in many cases, a very large chunk of his working capital is blocked. He is helpless, he cannot handle the volume at one time, he cannot muster so many trucks and there is not enough labour. Yet the clock is on. The railways have their own limitations of statutory time limit during which the contents of the entire train should not only be unloaded but also taken out of its premises." [37]

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37. Ibid; p. 69.

Similar problem is faced at the loading end also. At both ends, the manufacturers, however, get penalised with demurrage for not coping with the time limit. Neither the manufacturers nor the railways are fully geared up at the despatching end and at the receiving end to smoothly operate rake movement. In fact, with the introduction of the policy of block rake movement, the manufacturers had to bring about a realignment in their despatch mechanism and change their entire planning of despatch, storage and sale of their fertilisers.

Apart from the constraints described above, the block rake movement bristles with certain other constraints such as uncertainties regarding the time and date of availability of rail rakes for loading, rivalries among the railway divisions on interdivisional allocation of the rakes, resultant adverse effect on road despatches because of priority to be given for rake loading, etc.

All these constraints have to be overcome if the policy of block rake movement should succeed on a lasting basis. Detailed and extensive planning at different levels is the first prerequisite for effectively operating the policy of movement by rakes. Creating the necessary infrastructural facilities at both ends - the loading end and the unloading ends is of equal importance.

Even, the railways and the government admit that the new policy suffers from all these constraints and has the net effect of adding to the total distribution costs, in comparison with the previous policy of taking the cargo in wagon loads to anywhere and everywhere. But, their contention is that the railways have no alternative to this policy. If the huge quantities of fertilisers have to be moved to the various parts of the country, it has to move in block rakes. They also contend that, the balance of advantages lies with block rake movement. Both these contentions appear to be well founded. The fertiliser industry had to accept this policy, though with some reservations and grumblings.

Experience in the last two years has proved that the policy of block rake movement will optimise the available national transport capacity. The policy is, however, not a panacea for the basis problem of inadequate transport capacity. The problem of transportation of fertilisers or, for that matter, the problem of overall transportation cannot be solved by such arrangements alone. Only by real expansion of transport capacity the problem will find a lasting solution.

(iii) The policy of block level delivery of fertilisers:

Till 1980, the terms of sale of fertilisers, practiced by the Pool stipulated that the fertilisers would be delivered by the Pool freight paid F.O.R. at any rail head in India. The transportation from the railheads to the actual places of sale/consumption was to the account of the distribution channel. The cost was supposed to be met out of the channel margins allowed by the Pool. The difference between the maximum selling price to the farmer and the Pool issue price to the channel constituted the margin.

In the latter half of 1980, the Government of India came forward with a new policy in respect of the terms of delivery of fertilisers. As per the revised policy, the pool as well as the domestic fertiliser industry were to take the fertilisers at their cost right up to the block level locations - whether the block has a railhead or not - whether the block is located close to the rail-head or far away from the rail head. And this improvement in delivery terms will not alter the existing channel margins or the existing prices of fertilisers.[38] Obviously, the new policy conferred a new benefit on the fertiliser distributing channels and through them to the farming community.

The earlier policy of railhead delivery and uniform distribution margins irrespective of whether the stocks are sold near-about the railheads or far deeper, had to some extent inhibited fertiliser sales and consumption in the interior parts. This inhibiting factor was sought to be overcome with the new policy of 'freight paid delivery at all the blocks' in the country, leaving the prices and distribution margins untouched.

The full implications of this policy will be discussed in detail in the chapters on 'Distribution Channels' and 'Distribution Margins'.[39] However, this policy change had certain implications with regard to the transportation function.

The new policy enlarged the fertiliser transport job by offering an incentive for pushing the fertilisers to the interior parts of the country. The domestic fertiliser manufacturers were required to arrange for such interior transport at their cost. The government viewed this activity as part of the transport job and preferred accordingly to

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38. Government of India, Ministry of Agriculture and Cooperation, <u>Guide lines for organising delivery of fertilisers upto block head quarters</u> dt. 29-10-1980. pp.3 - 4

39. Please refer chapters 11 and 12.

provide for this expenditure under transport rather than under dealer margin, though in actual practice both the Pool and the domestic industry gave a fixed amount to the channel as additional margin, in the name of block level transport rebate. In an era of escalating freights and shrinking provision by the government to cover them, the equated freight may just about cover the primary and secondary freights, but not the block level transport rebate which the manufacturers are required to extend under the new policy. So, transport cost optimisation acquired an added significance on account of this policy.

The new policy had another implication on transport - the role of road has enhanced to some extent at the secondary and tertiary stage. Even in the primary stage, road has assumed a slightly enhanced role for when the cost of directly moving the fertilisers by road from the factory to the block level locations is compared against the three stage movement by rail - factory to rake railhead as the first stage; rake railhead to warehouses as the second stage and warehouses to block level as the third stage all road route may prove profitable for some more destinations.

(iv) <u>Escalations in rail freight rates</u>:

The rail freight rates for fertiliser cargo have undergone very steep hikes in the recent past. Till 1980, the rail freight rates used to remain relatively stable. They were, in any case, not going up as frequently as read freight rates. The hikes in road ~~than rail~~ rates were not only more frequent but also far steeper. This was largely due to the effect of the hikes in diesel prices. As such, calculations of rail-road trade off points involved a general assumption that with every diesel price hike, road will cost more and the trade off point will get shifted more and more in favour of rail. Recent policy has, however, proved that such assumptions are erroneous. It cannot be assumed that only road freight rates would keep escalating frequently and rail freight rates would remain relatively more stable. Not it can be assumed that the rate of increase in road freight rates would be far more severe than that in rail freight rates.

Within one year, from 1-4-1981 to 1-4-1982, asmany as five escalations have taken place in rail freight applicable to fertilisers. Briefly, the escalations have been as follows:-[40]

(1) With effect from 1-4-1981, a 15 percent supplementary charge was added to the freight rates ruling on 31-3-1981.

(2) With effect from 15-6-1981 the classification was upgraded from 45 to 50 for fertilisers listed in Division (E). It meant an increase varying from 8.9 percent to 10.3 percent.

(3) With effect from 14-8-1981, the classification was upgraded from 52.5 to 57.5 in respect of fertilisers listed in Division (A). It meant an increase varying from 7.8 percent to 9.2 percent.

(4) With effect from 1-1-1982, additional supplementary charges of 10 percent upto 500 KM and 15 percent beyond 500 KM. was imposed.

(5) With effect from 1-4-1982, another 15 percent additional supplementary charge was imposed.

The cumulative effect of these escalations has been to push

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40. For details, please see Appendix - XV, p.393.

up the fertiliser freight by 46.6 percent to 60 per cent depending upon the category of fertilisers and the distance slabs travelled.[41]

The railways may have their justification for such freight hikes. It is sufficient to mention here that any discussion on fertiliser transport should take due note of the realities in respect of freight rates. It should also be recognised that in an era of escalating freight rates one cannot draw a stable trade off point between rail and road and claim that beyond that point the advantage lies with rail.

Transportation costs in the fertiliser business:

The survey of the fertiliser industry conducted as a part of the present study has revealed that transportation is the most significant cost area in fertiliser marketing. It is seen from the survey that transport and handling costs account for as much as 35 percent of the total marketing costs in India's fertiliser business.[42]

The RITES report (1978) mentions that about 34 percent of the total distribution cost in the fertiliser business is in the form of transport cost.[43]

B.P. Sikdar estimated in 1978 that transport cost forms 8.38 percent of the farmgate price of Urea.[44]

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41. Ibid;

42. Please see chapter 13.p. 337 and chapter. 9,p. 222.

43. Rail India Technical and Economic Services Ltd. (RITES) Report on Fertiliser and Raw material transportation in India; (RITES Report), RITES, New Delhi, 1978.

44. Sikdar B.P.; "Logistics of fertiliser distribution in relation to increase in energy costs," Fertiliser News August, 1980; Op.cit; p.49.

All the figures of transport costs mentioned above have included the cost of transport and handling of the fertilisers from the factory to the retail outlets, but have excluded the cost of transport from the retail outlets to the farm yard which is borne separately by the farmer.

Estimate of transport cost in 1980-81

The survey of the fertiliser industry conducted as a part of the present study has revealed that nine major fertiliser firms incurred the undermentioned costs on transport and handling during 1980-81.

F i r m	Transport cost in 1980-81 (Rupees per tonne; average of all products put together.) [45]
IEL	81
MFL	87
GSFC	90
RCF	95
SFC	120
MCF	136
FACT	163
IFFCO	178
SPIC	198

The quantities of fertilisers transported by these firms in 1980-81 were as follows:

F i r m	Total quantity of fertilisers transported in 1980-81 (M.T.) (Products covered by retention price) [46]
IEL	284000
MFL	707000
GSFC	389000
RCF	612000
SFC	254000
MCF	182000
FACT	6[illegible]5000
IFFCO	976000
SPIC	526000

Note: Quantity produced in the year is taken as quantity transported in the year in all the above cases.

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45. Extracted from Table-1 in Chapter-13-p. 334

46. Extracted from Appendix-XVI, page. 394

As such, the weighted average cost of transport in respect of these firms works out to Rs.134.50 per tonne. It is reasonable to take this figure as the average for the industry as a whole in respect of the products covered by the retention pricing system. In this category of products a total quantity of 6.35 million M.T. was transported during 1980-81.[47] Accordingly, the transport costs incurred by this category of fertilisers during 1980-81 works out to Rs.85.4 crores.

As regards imported fertilisers which consists of potassic as well as nonpotassic fertilisers, a total quantity of 4.6 million M.T. of such fertilisers was transported during 1980-81.[48] The cost of transport in respect of imported fertilisers is usually much higher than the cost of transport in respect of products covered by the retention price system. Separated data for the pool fertilisers is not readily available since the pool is disbursing to the distributing agencies, an omnibus margin which covers compensation for several items besides transportation. However, on the basis of the ratio of transport leads of domestic and imported fertilisers, the transportation cost in respect of imported fertilisers can be assumed as Rs.180/- per tonne. The total costs of transport of fertilisers in this category will, therefore, work out to approximately Rs.83 crores.

As far as the category of domestic fertilisers not covered by the retention price system is concerned, a total quantity of 1.89 million M.T. of such fertilisers was transported in 1980-81.[49]. The

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47. Please see Appendix XVIII, p.397

48. Please see Appendix - XIX, p. 398

49. Please see Appendix -XVIII, p. 397

cost of transport in respect of products in this category is usually lesser than the cost of transport in respect of the products covered by FICC equated freight. Based on an estimated transport cost of Rs.101/- per tonne, in respect of fertilisers in this catagory, the total costs of transport as far as this category is concerned will work out to approximately Rs.19 crores.

As such, the total transport costs incurred in 1980-81 by all catagories of fertilisers will work out to Rs.187.4 crores. The unit cost of transport will work out to Rs.146 per tonne.

<u>Estimate of transport cost in 1982-83</u>

At the time of commissioning the survey of the industry as a part of this study, the latest cost data that could be generated was that of 1980-81. Since the study had been in progress for two years beyond 1980-81, the cost figures of 1980-81 could no longer be described as the latest. In the intervening period, significant escalations have taken place in the various elements of marketing costs in the fertiliser business. Costs of transport in particular have gone up steeply during the period. As was noted earlier, the increase was particularly significant during 1981-82 because of the steep hike in railway freights during that year.[50] This escalation got reflected fully in the transport costs of 1982-83. Actual costs of transport for 1982-83 could not be collected through the census survey of the fertiliser industry. As a matter of fact, the year 1982-83

50. Please see pp.216-218 above

is not over at the time of submission of this dissertation. But the final figures of equated freight allowed to all the fertiliser firms covered by the retention price system have come out. Though these figures do not represent the actual transport costs of 1982-83, they will be pretty close to the actuals for most of the firms. The details of the equated freight for 1982-83, firm-wise and product-wise are furnished in Appendix-XVII, page 395.

The quantities of various categories of fertilisers transported during 1982-83 have also not yet become available, as the year under reference is not yet over. An estimate, therefore has to be made in respect of the quantity of fertilisers transported in 1982-83. Based on the trends seen so far, it is reasonable to assume that the quantity of fertilisers transported in 1982-83 will be higher than the corresponding quantities in 1981-82 by approximately ten percent. It can be seen from Table-5 below that a total quantity of 13.59 million M.T. of various fertilisers was transported in India in 1981-82. A ten percent increase in this quantity would mean 14.95 million M.T. The break up of these quantities is given in Table-5 below:

TABLE - 5

Quantity of fertilisers transported in 1981-82 and 1982-83.[51]

Category		Quantity actually transported in 1981-82 (in million M.T.)	Quantity assumed for 1982-83
Domestic fertilisers under retention price system	-	8.28	9.10
Domestic fertilisers not covered by retention price system.	-	2.06	2.27
Imported fertilisers	-	3.25	3.58
Total		13.59	14.95

51. Extracted from Appendix XVIII, page 397 and Appendix XIX, page 398

As far as the domestic fertilisers under the retention price system are concerned, the estimated weighted average transport cost works out to Rs.161.21 [52] per tonne. On the basis of this weighted average, the total cost of transporting 9.10 million M.T. of fertilisers in this category in 1982-83 works out to Rs.147 crores.

As regards the category of domestic fertilisers not covered by the retention price system is concerned, a total quantity of 2.27 million M.T. was transported in 1982-83. Applying the same formula that was used in estimating the transport cost in respect of these fertilisers during 1981-82, the transport cost for 1982-83 for this category of fertilisers could be taken as Rs.121 per tonne. The total cost of transport of this category during 1982-83 will therefore work out to Rs.27.5 crores.

In the category of imported fertilisers which consists of potassic as well as nonpotassic fertilisers, a total quantity of 3.58 million M.T. of such fertilisers was distributed during 1982-83. Applying the same formula that was used in estimating the transport cost of this category of fertilisers in 1980-81, the cost of transport in 1982-83 for this category could be taken as Rs.215/- per tonne. On this basis the total cost incurred in transporting 3.58 million M.T. of fertilisers in this category during 1982-83 could be placed at Rs.77 crores.

As such, the total transport costs incurred by all categories of fertilisers in 1982-83 will work out to Rs.251.5 crores. The cost of transport per tonne will work out to Rs.168/-

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52. For details of computation, please see Appendix-XX, p. 399.

Noteworthy features of the
fertiliser transport cost:

The two most noteworthy facts emerging from the foregoing analysis of the costs of fertiliser transport are:-

(i) Transport costs in the fertiliser business are showing an uptrend.

(ii) There are wide inter firm variations in fertiliser transport costs.

(i) Uptrend in fertiliser transport costs:

The transport costs in the fertiliser business of India have gone up from Rs.187.6 crores in 1980-81 to Rs.251.5 crores in 1982-83. The increase in transport cost could not be attributed merely to the increase in the volume of fertilisers that has taken place in the intervening period. For, whereas the volume has registered an increase of 17 percent only, the cost has registered in the same period, an increase of 34 percent. The cost of transport of a unit quantity has gone up from Rs.146 to Rs.168/-

(ii) Interfirm variations in transport costs:

From the data on transport costs of individual fertiliser firms for 1982-83, presented in Appendix - XVII it can be seen that there are wide interfirm variations in transport costs in the fertiliser business.[53] As a matter of fact, the interfirm variations are not limited to transport costs. Variations are seen in the total marketing costs as well as in several individual components of the marketing costs, besides transport costs. But, the interfirm variations in transport costs are especially large.[54]

53. Please see Appendix-XVII p.395

54. Please see Chapter-13, p.346

Wide variations in transport costs are seen not only between one firm and another, but also between one fertiliser product and another. When all the firms and all the products are considered, it is seen that the transport cost varies from Rs.81/- per M.T. to Rs.274/- per M.T. Urea of Bhatinda Unit of National Fertilisers Ltd. (NFL) has incurred the lowest transport cost and DAP of Madras Fertilisers Ltd. (MFL) has incurred the highest.

Even when one particular product is considered, the variation between maximum and minimum costs of freight for that product is very wide. For example, when Urea alone is considered, the transport costs vary from Rs.81/- in respect of NFL, Bhatinda Unit to Rs.235/- in respect of Hindustan Fertilisers Ltd. (HFC), Namrup Unit. The simple average of transport cost in respect of Urea works out to Rs.185/-. The weighted average transport cost works out to Rs.195/-.

As regards DAP, the variation is between Rs.99/- per M.T. in the case of Gujarat State Fertiliser Company (GSFC) tp Rs.274/- per M.T. in the case of MFL. DAP of Southern Petro Chemical Industries Corporation Ltd.(SPIC) has incurred a cost of Rs.236/- per M.T. and DAP of Fertilisers & Chemicals, Travancore Ltd. (FACT) Rs.230/- per M.T. As regards 28:28, the Coromandal Fertilisers Ltd. (CFL) product has incurred Rs.164/- per M.T., the Zuari product Rs.201/- per M.T. and the FACT product Rs.239/- per M.T.

The two grades of complex fertilisers made by Indian Farmers Fertiliser Cooperative Limited (IFFCO) have incurred a cost of Rs.257/- per M.T. The fact that the two IFFCO grades add up a very large volume is significant. It has to be noted that the high cost, high volume transportation of these grades pushes up the average cost of transport of complex fertilisers considerably. As a general observation, it can be mentioned that the transport costs incurred by complex fertilisers is substantially higher than the transport costs incurred by urea.

Minimising the costs of fertiliser transport:

From the foregoing analysis of the fertiliser transport costs, it is evident that there is urgent need for reducing the costs. It is imperative in the interest of the fertiliser industry, the national exchequer and the farmers of the country. Analysis shows that there are only two main routes to cost reduction in fertiliser transport. They are:-

(1) Optmising the modal mix
(2) Reducing the lead of the traffic by rationalising the distribution of the commodity.

Optimal inter-modal mix for fertiliser transport:

The determination of the optimal intermodal mix will provide one half of the solution for achieving economy in fertiliser transport. It was seen earlier that rail and road are the main components of the modal mix for fertiliser transport. Coastal shipping and inland water transport are no doubt, resorted to in some areas, but they are as was noted earlier, totally insignificant in the overall context.[55] Accordingly, the discussion on intermodal mix for fertiliser transport has to be confined to the mix between rail and road.

There are some objective considerations that have necessarily to be taken into account in any exercise on optimal intermodal mix. There are also several practical considerations that require to be taken into account.

55. Please see page 198 above.

Objective considerations for
choosing optimal modal mix:

The 'objective considerations' that should go into the determination of the optimal inter modal mix are:-

* What is the relative energy efficiency of the different transport modes? Or, what is the transport output given by the different modes per unit of energy consumption?
* How do the different modes of transport compare in respect of 'resource cost' to the economy? Which is the mode that incurs the least 'resource cost' to the economy for a unit of transport capacity?
* How do the different modes compare in respect of actual costs to the user? Which is the most economic mode? What is the trade off point between one mode and the other? Is the mode that is seemingly the most economical, really the most economical if all the costs are considered together?
* At a given point of time how good is the availability of the most economic and most efficient mode? Can it carry 100 per cent of the traffic? Is it available timely?
* How much of user-orientation do the different modes have?
* What is the quality of service provided by each of them?

It is not certainly easy to apply all the above mentioned objective considerations and arrive at optimal inter modal mix. For eg., determination of 'resource cost' of the alternate modes bristles with several complexities. 'resource cost' involves several components like 'costs to the operator', 'costs to the user' and 'costs to the society'. How do we compare the resource costs of one mode against that of another? There will be similar difficulties in applying the other 'objective considerations'. On top of all those problems, it may also happen that the Government, for valid reasons, applies some non-efficiency considerations (socio-political considerations) in the determination of optimal inter modal mix of transport. All the same, one has to make a sincere attempt to evaluate the relative merits of the different modes by applying the objective considerations.

The energy consideration:

The foremost among the objective considerations is the 'energy efficiency factor' of the different modes of transport. The transport sector uses nearly a third of the country's total commercial energy and more than half of the country's oil supplies.[56] The National Transport Policy Committee, (NTPC) has emphasized the importance of the energy factor by its observation "There is no doubt that energy conservation will be the most important guiding principle in the frame work for determining an optimal mix of our future transport system."[57]

Since energy conservation is a fundamental and unexceptionable requirement, we may without further investigation, accept it as the most important among the objective considerations in the determination

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56. Report of the National Transport Policy Committee; op.cit; p.27

57. Ibid; p.8

of optimal modal mix and see how the different modes stand in relation to this consideration. If the different modes of transport have substantially different energy efficiencies, it is evident that the mode that yields maximum transport service per unit of energy consumption, has to be preferred.

National Institute of Training in Industrial Engineering (NITIE) has worked out the propulsion efficiency of freight transport in India by rail and road. The details are given in Table - 6.

TABLE - 6.

Propulsion Efficiency of Freight Transport in India.[58]

Mode	Fuel Efficiency (BTU/tonne-km)
Steam Train (b)	2764.80
Diesel Train (b)	166.30
Electric Train (b)	105.76
Diesel Truck (c)	1587.30

(b) Density class 20,000 to 30,000 net-tonne-km per day per km of route

(c) 7.5 tonne pay load, 40 km. average speed.

It is evident from the above Table that Railways (electric traction followed by diesel traction) is the most efficient mode of transport from the energy angle. It is also evident that the steam traction of the Railways is the least efficient mode of transport confirming thereby, the age old saying that the most expensive of

58. Ibid; p.43

all inventions is Stevenson's steam engine!

The 'Resource cost' consideration:

The NTPC after studying the comparative resource cost advantages of the different modes of transport have felt that for large volume commodities like coal, fertiliser, wheat, cement etc., the advantage of 'Road' is limited to short hauls of 200-250 Km and beyond that distance range, the advantage lies with 'Rail'. In this finding, the NTPC has largely gone by the study on resource costs conducted by Rail India Technical Services (RITES). The planning commission had earlier entrusted RITES with a study of the comparative resource costs of the different modes of transport. RITES considered the costs to the operator and the costs to the user but excluded the costs to the society in their exercises on the subject, Social costs were kept out due to difficulties relating to its conceptual clarity as well as quantification of its effect. The break even point in resource costs, in respect of fertilisers, as per the RITES study is shown in Table - 7.

TABLE - 7 .

Resource cost break even point between Road and Rail for fertilisers (in K.M)[59]

Commodity: Fertiliser

Diesel Single Line		Diesel double Line		Electric double line		Average *
Block load	Wagon load	Block load	Wagon load	Block load	Wagon load	
183	275	185	281	155	222	200

* Average of the three transactions appropriately moderated by the proportion between block load and wagon load in which the cargo presently moves.

59. Ibid; p.32

It can be seen from the above figures that beyond the trade off-zone of 200 km. rail is advantageous for fertiliser traffic. It must however be remembered that such cut off points vary dependant on several factors. Even within a given mode of transport, the costs are seen to vary dependant on how the cargo is carried. For example, within rail transport, the costs differ depending on whether stocks are hauled by diesel traction, single line or double line or by electric transaction. The costs also differ depending on whether the stocks are hauled in wagon loads or in train loads. Between wagon load movement and train load movement the variation in the resource costs is as high as 30%. Like wise, there are variations in the costs depending on whether the traffic involves break of geauge/transhipment or not.

'Availability'
<u>considerations</u>

Apart from 'Energy Efficiency' and the 'Resource cost' considerations, the existing realities regarding availability of the different modes, timeliness of availability, adequacy of capacity, operational aspects etc. also have to be taken into account. It was seen earlier that the availability of rail transport for moving fertilisers was inadequate in the years 1977-78, 1978-79 and 1979-80.[60] The position has however improved considerably in 1980-81 and more so in 1981-82. The railways presently evince confidence for moving as much as 85% of the total fertiliser traffic. While such a high level of transportation may not be achieved by the railways there is no doubt that no other transport mode is available in a larger measure than rail. The railways have been and will continue to remain the most massive component of the transport system in India. It is available extensively.

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60. Please see page 204 above.

The consideration of
'Actual cost to the user':

From the foregoing paragraphs, it may appear that Rail qualifies for the pre-eminent position in fertiliser transport. But deeper analysis shows that Rail is not such a convincing winner. When it is questioned whether irrespective of the resource cost advantage and energy efficiency, the cost to the user in the case of rail is **really far** lesser than road, the answer is not very encouraging. After all, the user will not opt for a particular mode, merely because it is in national interest to do so or it is the best from the point of view of resource cost and energy efficiency. Other things being equal, he will prefer the mode that costs less. Between rail and road, other things are not equal; they are loaded in favour of road because of its better user orientation. **This was explained in detail earlier.** [61] If costa are also higher in the case of rail than in the case of road, the users will no doubt prefer road. The cost to the user is seen to be lesser in the case of rail for long distances, but the same is not true of short distances. For medium distances, rail used to be cheaper but the position is shifting with the recent steep hikes in rail freight rates.

Another factor is that on a total cost basis, rail is not cheaper to the user in respect of most distance slabs. This is only partly attributable to the recent hikes in rail freight rates. It is largely due to the multi stage movement and handling involved in rail transport especially after the advent of the policy of moving fertilisers by unit trains. This policy and its implications were explained in detail in the section under "Movement by unit trains'. When an analysis is made on a total cost basis, it is

61. Please see pp.200 - 204.

seen that the economy claimed by rail is undermined in several cases because of the policy of limiting the rail movement of fertilisers to unit trains. When movement takes place only in unit trains and only to a few selected rail heads and from these rail heads if the stocks have to be transported over long distance by road, to reach the'real destinations', rail transport loses its advantageous position in the matter of 'cost to the user' even in respect of distance slabs in which it hold the cost advantage prior to the advent of the policy of moving stocks in unit trains. It cannot be axiomatically assumed that moving by rail is cheaper in certain distance slabs. The total costs involved in the rail-cum-road movement has to be compared against the total costs involved in road.

The new policy of restricting rail movement of fertilisers to unit trains, affects not only the consideration of 'cost to the user' but also the energy consideration that was discussed earlier. It cannot be assumed that movement by rail ensures the best energy efficiency. In some cases, rail may still ensure the best energy efficiency. In some cases, all road movement may result in better energy efficiency than rail cum road movement especially when the latter involves multi stage movement. One has to take a total approach to the job, and analyse the total cost as per current tariffs and the total energy efficiency, before drawing any conclusion on the relative merits.

Unit level considerations in
choosing the optimal modal mix:

It can be easily appreciated that a standard optimal intermodal mix cannot be applied to all the fertiliser units in the country. Only the broad principles could be applied commonly, and the actual modal mix has got to be worked out separately for each manufacturing unit, taking into consideration the peculiar features of that unit. Several factors will influence modal mix decisions at the unit level. Important among them are :-

- Location of the factory
- Extent of marketing territory under primary market, secondary market and tertiary market.
- The 'Marketing System' adopted by the unit.
- Availability, adequacy, timeliness, convenience and costs of the alternate transport modes within the marketing zone of the unit.
- Seasonality factor within the marketing zone of the individual unit.
- Nature of the products made by the unit - fast moving or slow moving etc.
- Aspects relating to warehousing - the warehousing policy of the company, the number, locations and capacities of the warehouses and their accessability by rail and road.
- 'Customer service level' aimed at by the unit.

The relative emphasis between rail and road may vary not only from unit to unit but also from time to time and product to product for the same unit. The 'trade off point' between rail and road will be the prime consideration but not the sole consideration . Compromises have to be made in the light of the realities. It is also necessary to look at the trade off point in the broadest sense and not in the narrow sense of the actual freight differential, since a variety of mutually interacting costs other than freight are involved in marketing and distribution.

In summary, it may be stated that the two major alternate modes have their associated attributes, associated costs, merits and demerits. They have also their own capacity constraints. All these factors must be considered together while deciding on the optimal modal mix. Since the transport problems of individual units vary widely, the unit level considerations must also be taken into account in the determination of the optimal modal mix.

Reducing the lead of the
fertiliser traffic:

Optimisation of intermodal mix examined above will provide one half of the solution for achieving economy in fertiliser transport. In what follows, it will be seen that reducing the lead of the traffic (distance travelled) will provide the other half of the solution.

Long lead is a major problem with fertiliser traffic. Since the cargo is bulky, long lead has the effect of pushing up the total cost of transport considerably. Long lead also implies wastage of energy; In addition, it increases the resource costs; Above all, it adds to the strain on the transport system to the point of breakdown. Luckly long lead is not totally unavoidable in the Indian fertiliser business, even though, to an extent, it is unavoidable in the existing context.

In Chapter 6, it wasmentioned that the fertiliser factories of India are not evenly spread out throughout the country.[62] They are

62. Please see Chapter - 6, p.81.

concentrated in a few places at the west and south zones dominate the production scene. Phosphatic fertiliser production is particularly concentrated near the ports. It was also mentioned earlier that such raw material and port based location of fertiliser production has permanently saddled the transport system with long lead pattern.[63]

In the past few years some dispersal of fertiliser production has taken place. But, paradoxically, the fertiliser lead has still been continuously going up. During the decade 1965-66 to 1975-76 the average fertiliser lead rose from 675 km. to 859 km. In 1976-77 it became 900 km. In 1977-78 it skyrocketted to 1100 km. There afterwards it is oscillating between 1000 km. and 1100 km.[64.]

The 'RITES' study [65]

The continuous increase in the lead of the fertiliser traffic had two main adverse effects. In the first place, it pushed up the cost of transport of this vital agricultural input. Secondly, the turnaround of the rail wagons got slowed down due to the long lead. With the given rolling stock, the transport capacity of the railways had come down.

When the railways started feeling increasingly the strain of moving the everexpanding fertiliser traffic, they made an indepth study of the problems involved in fertiliser movement. In fact, the

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63. Please see p.188 above

64, Ramaswamy V.S. Op.cit; p.5

65. This section and the next section are based partially on an earlier article by the research scholar. Please refer Ramaswamy V.S. "RITES Report and the fertiliser Industry", Fertiliser Marketing News, September, 1978.pp.1-4

study was made at the instance of the Ministry of Agriculture of the Government of India. The consultant wing of the Indian railways, the Rail India Technical & Economics Services (RITES) was commissioned to conduct the study on the 'Transportation of Fertilisers and Fertiliser Raw materials'. RITES brought out a detailed report. The salient points of the RITES study were as follows.

The study introduced the concept of nodal points or demand centres, about 140 in number,all over the country for the purpose of working out the optimum transport plan consistent with a viable distribution system. Trends of consumption, irrigation potential, transport facilities, warehousing facilities, administrative infrastructure, etc., were among the criteria in deciding the location and number of points. Other parameters fixed were that movement must be in the forward direction and conform to the existing patterns of rail traffic and that the break of guage/transhipment should be avoided and that criss cross movement of fertilisers should be avoided.

As a part of the transport optimisation model the RITES study developed a rationalised and economic marketing zone for each fertiliser producing unit in the country within which only transport of fertilisers from that unit should take place. The report explains the logic followed in this exercise in the following words.

> "Based on the guidelines given by the Government of India and the assumption explained elsewhere in the Report, a computer programme was run for preparation of a rationalised movement plan for each domestic fertiliser manufacturer. The production and consumption for 78-79 wastaken into account. The computer results were moderated to conform to the normal patter of rail traffic". 66

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66. <u>RITES report</u>. <u>op.cit;</u> p.

The fertiliser industry rejected the rational distribution model suggested by RITES. The main reasons for the rejection were as follows:

(1) The RITES study was essentially aimed at a transport optimisation model. Transport is but one of the several components of the fertiliser marketing job. Marketing of fertilisers is a unified system. The efficiency of the system is not directly proportional to the efficiency of any single element of the system such as transport. The major concern should be with the total system efficiency and the total system cost and not with any particular element of it, such as transport efficiency and transport cost.

(2) Even within transport, the study has looked at only the primary component of transport, i.e., the transport from the factory to the nodal rail head. Two further stages of transport are involved from the nodal point. The RITES study has attempted to optimise the primary transport in isolation. It has not bothered to consider the effect of such optimisation on the secondary transport. Nor has it attempted optimisation of primary and secondary transport taken together.

(3) The rational and economic marketing zone suggested by RITES is not acceptable to many of thefertiliser units. The units would like to have a larger marketing zone to take care of various fluctuations in fertiliser marketing.

(4) RITES have derived the national marketing zones by a simple matching of the demand and supply in terms of N, P, K. Such a matching will not be an acceptable marketing exercise. The product mix of the units and the product preferences of the farmers should also be taken into consideration.

(5) Further, the RITES model has put together disjointed territories asmarketing zones for some of the units.Contiguous areas have

been skipped for the sake of railways convenience.

Rationalisation in the case of Pool fertilisers:

As far as the pool fertilisers, i.e., the imported fertilisers were concerned, the RITES study suggested that for each port in the country, a rationalised hinterland should be identified which will normally be the natural distribution zone for that port. This is not practised now. Also at present, five major ports in the country account for 90 percent of tatal fertiliser imports.[67] The RITES study wanted this pattern also to be changed.

Generally speaking, the RITES study did not give the same degree of attention to rationalising the movement of Pool fertilisers, as it gave to the rationalisation of the movement of the domestic fertilisers. The domestic industry feels, and rightly so, that the irrational movement is far greater in the case of Pool fertilisers than in the case of domestic fertilisers. Statistics on the lead pattern and turnaround of wagons are not available separately for domestic production and for Pool stocks. If the Railways would construct such data, it would be very revealing.

No doubt, rationalisation of the movement of Pool fertilisers is far more difficult than rationalising the movement of domestic fertilisers. In the first place, advance planning of movement is more difficult in the case of Pool fertilisers than in the case of domestic stock. Imported shipments may not reach the Indian ports with assured regularity as domestic fertilisers come out of the production pipeline. Also, the movement of the imported fertilisers, gets compounded by problems of port operations, problems of port labour, vagaries of ship arrivals, bunching of ships, last minute diversions of ships to other ports, etc.

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67. RITES Report, op.cit; p.

Yet rationalisation in the case of imported fertilisers is as essential as in the case of domestic fertilisers. Irrespective of the limitations, persistent efforts should be made towards rationalisation.

There have been some attempts at streamlining and rationalising the movement of the Pool fertilisers. But when pressure starts building up, all planning go haywire and rationalisation is given the go by. Obviously, tenacious efforts are required for achieving durable results. The pain is worth taking, since the rewards of rationalisation would be immense in the case of Pool fertilisers.

Subsequent developments on
<u>rationalisation of fertiliser movement</u>:

In the efforts at rationalising fertiliser transport, an improvement over the RITES study has been attempted by another study on Development of infrastructural facilities at the nodal points in Northern Indian States.[68]

This report offered a modal for identifying the optimum number, size and location of nodal points with the objective of minimisation of total transport cost including Primary rail transport and secondary road transport. The model assumed that the market share of a manufacturer in a state is directly proportional to the production capacity of the unit and inversely proportional to the distance of the unit from the market.

Conceptually, this study contained an improvement over the RITES study. Whereas the RITES study concerned itself with only the primary component of fertiliser transport, this study considered both the primary and the secondary transport and aimed at a model

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68. In 1982 the Ministry of Agriculture, Government of India sponsored this study. Fertiliser Planning and Development of India Ltd., (FPDIL) carried out the study and submitted the report to the government in March, 1982.

optimising the total transportation cost. This study introduced another improved concept - viz. the inverse relationship between market share and distance from the point of production.

As a matter of fact, these two concepts were developed earlier by the working group constituted by the Ministry of Chemicals and Fertilisers of the Government of India for the purpose of identification of nodal points in U.P., Haryana, Punjab and the Sri Ganga Nagar district of Rajasthan. It is worthwhile to reproduce the norms assumed by that working group.

"In that exercise, for arriving at the likely supplies to different States from different producing units the important assumptions were:

- the main marketing area of any fertiliser production unit will be restricted to 1500 km. in the case of complex fertilisers the lead may have to be longer.
- in any particular area (district) the supplies from producing units, situated within 1500 km. will be directly proportional to their production capacity and inversely proportional to the distance of each.
- to the extent a unit is not able to dispose of its entire production within the 1500 km. the extra quantity will be moved to more distant markets on the basis of over all deficit in those areas".[69]

69. Government of India, Ministry of Chemicals and Fertilisers, Report of the working group on identification of Nodal points in U.P, Haryana, Punjab and Sri Ganga Nagar district of Rajasthan (unpublished report), New Delhi . 1980.

The inevitability of rationalisation in fertiliser movement:

It has to be recognised that the country has no escape from the basic concept of rationalisation of fertiliser movement. India with more than 1.25 million square km. of area, is the fifth largest nation in the world in land area. It exrends by more than 3000 km. south-north and more than 4000 km. east-west. It is inevitable that the country is segmented into a number of homogenous and relatively smaller zones or regions for the purpose of transporting and supplying various essential commodities. This should be especially applicable in respect of commodities like fertiliser which are produced and consumed in large volume. To the extent the sources of production are spread out and to the extent compact zones with selfbalancing demand and supply could be carved out, it must be the endeavour to limit all flow of materials within such zones and achieve maximum economy and efficiency in the transportation of the commodity. It is often said that long lead arises on account of locational imbalance between the producing units and the consuming areas. This is true only upto a point. Within the constraint of locations, it is possible to rationalise the movement to a substantial extent.

As regards imported fertilisers also, it is said that the locational imbalance between the ports and consumption areas is the main reason why rationalisation attempts do not succeed. This again is true only upto a point. It is possible to attempt a good measure of rationalisation within the constraint of port location.

Recent decisions to locate some of the new fertiliser capacity nearer the consumption areas may help the process of rationalisation of fertiliser transport. Growth in consumption of fertilisers is the zones, where production is at present concentrated, may also help rationalisation and reduce the need for the factories located in any given zone to seek markets in far off zone. This may incidentally release the painful pressure on the country's south-north rail corridor. But, without waiting for these developments, efforts at rationalisation can be intensified within the existing constraints.

In fact, the domestic fertiliser units are themselves interested in rationalising their marketing zones, upto a point. It is the normal tendency of the units to market their production as near the factory as possible. Even if the railways permit long distance movement, the fertiliser units should not be normally interested in such movement, for, they have not only to incur the extra freight, but also to suffer the lead time and face the risks of marketing in distant and unfamiliar territories and the eventual squeezing out by the new units coming up in those territories.

The difference of opinion between the fertiliser units and the Railways is therefore not on the concept of rational marketing zones but on how to fix the rational zone for each unit. Obviously, it cannot be fixed arbitrarily by a government agency or the carrier of the cargo. What is required is to find a balance between the needs of the fertiliser industry and those of the railway system. Cost reduction must ~~be~~ remain the major aim. But rationalisation cannot be pushed beyond a point, since marketing of fertiliser or for that matter, any other commodity cannot be operated simply on a 'transport optmising model'.

Pragmatic rationalisation of movement is the real answer. It will create substantial savings in transport cost, for the manufacturer. It may in due course lead to lower delivered price of the fertiliser for the former. Also, it saves national resources and reduces the strain on the transport system. Above all it appears that without such rationalisation, the railways just will not be able to generate the wagons required for moving the ever growing volume of fertilisers. The fertiliser stocks will remain at the factories, if the movement is not rationalised.

To sum up, rationalisation must be applied to rail movement as well as road movement, to domestic fertilisers aswell as imported fertilisers. The alternative to rationalisation is to saddle the country with an ever worsening high cost supply system for fertilisers.

C H A P T E R - 10

FERTILISER WAREHOUSING

The importance of inventory management:

Inventory strategies and decisions play a significant role in the fertiliser business. In fact, in every business, effective management of the inventory is of paramount importance for operating the business efficiently and profitably. In the fertiliser business, inventory management has acquired a special significance, due to a variety of reasons.

Carrying inventories becomes inescapable in a business because the producing activities and consuming activities take place, often, at different times, in different locations and at different rates. Inventories are usually made up of stocks in transit, supplies arising from periodic shipments and reserves carried to ensure service in the face of a surprise demand. In fertiliser business, inventories are also carried to accommodate seasonal sales operations as against continuous manufacturing operations.

Inventory management begins with the proper identification of the functions actually performed by inventories. It is followed by the development of appropriate strategies for keeping the inventories at optimum levels. This basic approach to inventory management holds good in the case of fertilisers as well.

Inventory management is becoming an increasingly important function in fertiliser marketing:

In the fertiliser business in India, the inventory management function is becoming more and more important day by day, as the cost of carrying inventory.

is constantly mounting up. By its very nature, fertiliser business involves a high level of stock holding. And the stock holding cost forms a significant part of the total marketing costs. With every increase in the price of fertilisers and every increase in the bank rate and borrowing rate, the importance of inventory management is going up. Credit squeeze and dear money policies accentuate this further. And often, as at present, (1982) there is a glut situation in the fertiliser business in India.

Even under normal conditions, the magnitude of the fertiliser warehousing job and the gravity of its cost implications are quite large. The magnitude can be easily understood from the fact that at a given point of time, 6 to 7 million M.T. of different types of fertiliser materials are stored in the various warehouses in India.[1] No commodity except foodgrains involves such massive warehousing as fertilisers do.

The need for <u>warehouses:</u>

In the chapter on fertiliser transport it was explained in detail that the special characteristics of the fertiliser business render the transportation of fertilisers into a critical, complex and difficult job.[2] The same characteristics make the warehousing job too a critical complex and difficult one.

Fertiliser is a highly seasonal and time sensitive product. Its consumption is not spread uniformly over the twelve months in an year.

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1. Please see page 267 below

2. Please see Chapter - 9, pp. 186-190.

Even in areas where irrigation is available through out the year, fertiliser consumption does not take place through out the year. It is restricted to specific seasons. For any given crop, fertiliser application takes place during a few days within the duration of the crop. In the rest of the duration of the crop, no application takes place. In dry areas and areas where only one crop is grown in an year, the effective number of days in an year during which fertiliser application takes place are really very few. This seasonality factor necessitates a high level of storage, in the off-season months, especially because the production of fertilisers has got to be a continuous process - round the clock and through-out the year, for techno-economic reasons.

Over and above the seasonality factor, the governments in the centre and in the states favour, as a matter of public policy, the holding of high level of buffer stock of fertilisers in view of its crucial role in the agricultural production of the country.

Further more, demand forecasting in respect of fertilisers is a difficult exercise. Vagaries of monsoon, shift in cropping patterns, shift in agricultural practices, shift in the choice of crop varieties etc. affect fertiliser forecasting. Large scale warehousing is necessary to take care of such factors.

The need for warehouses
<u>in the 'field'</u>

The location of warehousing facilities is an important question that arises in this context. The crucial question that arises here is whether it is preferable to have a net work of warehouses in the field or whether it would be better to organise the warehousing facilities at the factory.

In some of the fertiliser factories, a month's production can be as high as 50,000 M.T. It will neither be feasible, nor economic to provide for storage capacity at the factory to cover four or five months' production. Even if it is feasible to do so, it would be better to move out the production at an even rate and on a continuing basis to the field rather than resorting to 'season based' movement. There are any number of limitations on movement when one wants to move the stocks. The bottlenecks in transport, the physical limitations and the 'lead time' factor, all would favour an even and continuous outward movement of the products. This means that a large component of the total warehousing capacity will have to be in the field and not at the factory.

More than the compulsions of transportation, the marketing compulsion to make the stocks available to the distributors and retailers at the place and time convenient to them and in the right quantity has persuaded the fertiliser manufacturers to go in for a well spread out net work of field warehouses. Even where options are available to hold the stocks either at the factory or in the field, most manufacturers prefer to move it out and to hold it in scattered field warehouses. They prefer to do so in the hope of gaining a market advantage in the form of quickend product delivery to the distribution outfit.

Still large quantities of fertilisers are held

at the factory silos. The wisdom of the policy arises from experience, that the exclusive adoption of any one system of storage at the factory or storage in field warehouses, is impracticable. Normally, what happens is a combination of the two which results in a continuous flow of material, starting from the factory and passing through major and miner warehouses of the manufacturer and the distribution channel to the consumer.

Recent trends in warehousing
<u>of fertilisers:</u>

Certain changes occuring in the recent past, in fertiliser marketing have brought about corresponding changes in fertiliser warehousing also. Some of these changes come due to market factors and other due to changes in government policies. Both types of developments have influenced fertiliser warehousing.

Fertiliser distributors, in many parts of the country, are adopting a new strategy. They have developed a tendency for placing smaller and smaller orders at a time, but increasing the frequency of purchases. They expect the manufacturers to do most of the stockholding. This enables them to reduce costs. This almost implies a change in role of the distributors becoming mere brokers. The fertliser firms have no option but to expand the number, capacity and spread of their field warehouses.

A second major change has been that keen competition in the business has pushed the fertiliser manufacturers into a more liberal dealer - oriented warehousing policy. The field sales force of different fertiliser firms vis with one another to offer to their dealers greater convenience and reliability in fertiliser delivery. They exert continuous pressure on the firms to open up warehouses at as many places as possible. The fertiliser firms yield to this pressure and increase the number of field warehouses as was noted earlier, in the hope of getting a competitive advantage in the market place in the form of improved delivery to the distribution out-fit.

Related to these is the government policy. The government at the centre and in the states also place great stress on 'convenience in delivery' to the farmers and the distribution channel and expect the manufacturers to operate field warehouses at a number of centres in their marketing territories.

Equally important is the policy of the rail road system to the fertiliser cargo. As was pointed out in the earlier chapter, the railways insist on moving the cargo in full train loads (or block rakes) on a point to point basis and only to a few major rail heads called the nodal points or rake receiving points, they are prepared to take the cargo.[3] Fertiliser can no longer travel to any railhead of one's choice nor in quantities of unit wagon loads as in the past. As a result of this new policy on rail transport of fertilisers, large buffer warehouses at major rake receiving rail heads have become a necessity.

Another factor to be considered in this context is the new policy on pricing and delivery terms introduced by the government. According to these terms, the manufacturers are required to deliver the fertilisers 'freight paid' up to the block head quarters in the country. So far, the delivery was based on 'freight paid up to rail head'. This change has also resulted in some enlargement of the fertiliser warehousing activity.

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3. For details, please see Chapter - 9, pp. 207-214

At the same time, costs of warehousing of fertilisers are sky rocketing day by day. The main cost in warehousing is the cost of carrying the inventories, i.e. the interest cost. There has been enormous increase in the inventory carrying cost in the fertiliser business due to the steep hike in the prices of fertilisers and the equally steep hike in the cost of credit, ie. the bank lending rate. On top of the high value of the stocks and high interest rate, the volume to be warehoused has also gone up steeply, both in absolute terms and as a percentage to sales volume. As a result, the inventory carrying bills climb up. **This** point is ~~examined~~ in more detail subsequently.[4]

Alternate ways of managing
<u>the warehousing function:</u>

In the past, a couple of options were available to the fertiliser manufacturers in India in managing the warehousing job. In some cases, the manufacturer himself was bearing the burden of inventory holding in the field. In **others,** he was passing it on to the distributive trade. In **such cases,** appropriate compensation or incentives was passed on to the trade. Most manufacturers, however, had preferred to do a part of the warehousing job by themselves and pass on the other part of it to the distribution channel.

Whereever the manufacturers had passed on a substantial part of the stockholding responsibility to the channel, they were able to achieve some reduction in warehousing and inventory carrying costs. But the reduction was not real. They had offered larger compensation to the channel in

4. Please see pages 268-274 below

consideration of the 'stock holding'. What had happened was a mere transfer of the cost burden in respect of stock holding from the producer to the channel with the cost, reimbursed in good measure to the channel by the producer. Obviously, such a transfer did not result in real savings in warehousing costs. Real savings in warehousing costs could be brought about only by reducing the overall levels of inventories and eliminating all avoidable and wasteful warehousing expenditure, irrespective of whether the producer incurred the expenditure or the distribution agencies incurred it. Obviously, improved management of the warehousing and distribution jobs all along the line is the real answer to this.

There are certain advantages if the warehousing job is shared between the producer and the channel even if this does not result in real savings in the costs of warehousing. But, as was observed earlier, the compulsions of the present situation are such that the manufacturer himself is forced to bear the brunt of warehousing.

The fertiliser manufacturer has however, a wider choice in the matter of warehouse types. He can choose from among three or four alternative warehouse arrangements that are available.

(i) A net work of stock points run directly by the manufacturer

(ii) A net work of stock points operated by hiring warehouse space from central and state warehousing corporations at a number of places.

(iii) A net work of stock points by hiring space from private warehousing organisations, whereever they exist.

(iv) A mixture of all of the above.

Under the first pattern, three different types of warehousing arrangements are seen.

(a) A net work of company owned godowns at various places.

(b) A net work of hired,but company managed godowns

(c) A combination of both

In operation, there is no significant difference between (a) and (b). Likewise there is no significant difference between (ii) and (iii). But there is a significant difference between (i) on the one hand and (ii) and (iii) on the other. Each has its associated costs and benefits. Different firms have preferred different patterns based on their perceptions of the relative cost and benefit. The most commonly seen arrangement is the hiring of warehouse space from central and state warehousing corporations at a number of places.

Determining the number
location and size of warehouse:

The determination of the number, location and size of the warehouses is an important part of the overall warehousing strategy. On these decisions, depends the level of customer service and the competitive advantage in the market in relation to the distribution channel.

The number, location and size of warehouses also influence the warehousing costs to an extent. While, in general, the ratio of sales to inventory is the overall determinant of the warehousing costs, the costs are also influenced by the location and size of the inventories - at how many places and in what sizes, the stocks are held.

Generally speaking, the fewer the number of warehouses, the lower would be the cost of warehousing per unit of fertiliser handled. If the business gets divided among more warehouses, the volume handled by each decreases. Some amount of increase in sales, no doubt, can be expected as the number of warehouses is increased. It is a managerial task to weigh the cost benefit implications and decide upon the optimum number of field ware-houses. The choice of the optimum number of warehouses should depend upon the type of fertiliser handled, the geographical spread of each warehouse territory, the fertiliser consumption potential and the current level of consumption, the extent of seasonality of demand in that area, the level of peak demand, the number of distributors/ retail outlets to be serviced by each warehouse, the acceptable order - execution time, the possible speed of replenishment of stocks and, finally, the cost involved in operating the warehouses.

Along with the decision on the number of warehouses, the decision on the size of the warehouses must also be taken. Warehouse size and costs are inter-related inversely. As a rule, small warehouses are uneconomic compared with larger ones. A large number of small capacity warehouses, usually results in higher levels of inventory - expressed as a percentage of the sales and larger administrative overheads and other related costs. A fair number of large capacity warehouses would provide an advantage in this respect. Furthermore, improved material handling devices will be justified in larger warehouses. Supervision and management also will be more effective. All this favour a few large sized warehouses. On the other hand, customer convenience and speedier delivery call for a large number of small and medium sized warehouses. Considerations of economics and the available volume of business will call for a compromise. There will also be the additional balancing factor of future requirement both in terms of consumption and competition guiding the locations and sizes of the warehouses. As a general technique, we can say that by considering the level of sales in the area and the market share aimed at and by applying the two other factors of transit time and peak season demand, we can work out the optimum storage in a given place. Once the optimum level is crossed, advantage may lie with the opening of another warehouse at a new location than with further increasing the size of the existing warehouses.

Choosing the locations of the warehouses is as important as choosing the optimum number and capacity of each. In fact, these three decisions are very much interrelated. The suitability of the locations must be tested in terms of demand factors, market factors and competition factors. Transport facility and lead time from the factory to the warehouse location as well as from the warehouse to the consuming areas should be taken into account. Commercial importance of the location, sales tax implications, implications of octroi and other local levies have also to be looked into. Above all, the availability of suitable godowns at the concerned location is a prime consideration.

Present availability of warehousing facilities in India:

It is evident that a country of India's size and diversity needs a great deal of warehousing space spread throughout the country. Lack of adequate warehousing facilities does hamper in varying measures the supply systems in respect of several commodities in India, including fertiliser. Fertiliser does not have any exclusive warehousing facilities. It completes with various other commodities for a share of the storage space available in the country. Since the total cake is not large enough, the share is also inadequate. It is rather difficult to state in a precise manner, what part of the total warehouse space in the country is available for fertilisers, since there is no exclusiveness in this matter. But, from the data regarding the actual stock levels of fertilisers in the country, a rough estimate of the warehouse space available for fertilisers can be derived.

Also, the overall warehouse facilities available in the country could be assessed and the normal share of fertilisers in it as per the judgement of the main warehousing agencies could be determined. And from this data, the extent of warehouse facilities available for fertilisers could be derived.

At present, the Food Corporation of India (FCI) and the central and state warehousing corporations (CWC and SWC) provide a lion's share of the total space required for storage of fertilisers in India.[5] The state governments, civil supplies corporations and various commodity corporations in the country also operate a net work of warehouses. The cooperatives in the country at various levels also have sizeable warehouse capacity with them spread through out the country. A part of the

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5. Chhibber O.N. "Warehousing of Fertilisers - Needs and Challenges" Fertiliser News, July 1981, op.cit., p.14

warehouse capacity available with these agencies is available for storage of fertilisers. Table-1 gives the details of total storage capacity available with the different agencies in the country as on 31-3-1980.

TABLE - 1

Storage Capacity as on 31-3-1980 (owned)[6]

Agencies	(in million M.T.)
Food Corporation of India	7.6
Central Warehousing Corporation	2.0
State Warehousing Corporation	2.4
State Governments	1.9
Cooperatives	4.7
Total :	18.6

The capacities indicated in Table-1. relate to the owned and covered warehouse space with the respective agencies. In addition, there are other types of storage facilities with them. A sizeable capacity of hired and covered warehouse space is available with these agencies. There is also some uncovered storage space and temporary storage sheds. The Food Corporation of India has got, in addition, sizable capacity under its cover and plinth, (CAP) type of storage.[7]

6. Planning Commission, Government of India Sixth Five Year Plan 1980-85. New Delhi, p.110

7. For details of storage space with the FCI, please see Appendix XXI, p. 401.

Out of the warehouse space with the FCI two million M.T. capacity is available for fertilisers.[8] The pool fertilisers (i.e. the imported fertilisers handled by the Government) monopolise the warehousing space available with the FCI. CWC and SWC, on the other hand offer their warehousing space for stocking the pool fertilisers as well as the domestic fertilisers.

The central and State Warehousing Corporations together provide at present, a total warehousing space of about 8 million M.T. The Central Warehousing Corporation is operating 278 warehouses having a total capacity of about 3.3 million tonnes. The State Warehousing Corporations are operating 1023 warehouses with a capacity of five million tonnes. A State-wise list of the number of Central and State Warehouses and their capacity is given in Appendix - XXI [9]

O.N. Chhibber has made an estimate of the share of the total warehouse space of CWC and SWC that is used by fertilisers. He says, " On an average, about 35 percent of their total capacity could be taken as available for storage of fertilisers".[10] On the basis that 35 percent of the total space available with the central and state warehousing corporations is utilised by fertilisers, roughly 2.6 million M.T. space is available from these corporations for fertiliser storage. Normally, the CWC and SWC provide storage facilities at important centres only. These centres can be

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8. Chibber O.N. <u>op.cit</u>; p.14

9. For details please see Appendix - XXI, p. 402

10. Chibber. O.N. <u>op.cit</u>; p.14

considered as the nodal points for fertiliser storage and distribution. Usually, the fertiliser storage in these centres is of an intermediate character, awaiting further dispersal to consumption centres. They usually have large capacity - the warehousing space varying between 5,000 M.T. and 10,000 M.T.

The next tier of warehouses in India is at the mundi level. The cooperatives have more than 5,000 mundi level godowns in the country with a total capacity to store more than 2.5 million M.T.[11] These godowns are called marketing godowns. Usually, these warehouses at the mundi level have 500 M.T. storage capacity each. In addition to the cooperative godowns at the mundi level, the private wholesalers and semiwholesalers of fertilisers and various other commodities have also their own godown facilities. Precise statistics of what share of the total available warehousing space at the mundi level is available for or utilised by fertilisers are not readily available.

The last tier of warehouses is at the village level. These warehouses are termed rural godowns. They are mostly in the cooperative sector and are used mostly by the respective cooperative societies and their members. There are at present more than 24,000 rural godowns in the country in the cooperative sector each with a capacity of 100 M.T. on an average. The total storage capacity with them works out to 2.5 million M.T.[12]

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11. For statewise details of cooperative godowns at mundi level please see Appendix - XXIII, p. 403

12. Ibid.

If the mundi level and rural level warehouses are considered together, the cooperatives at present have a total of five million M.T. storage capacity. In addition to the godowns put owned themselves, the cooperatives also hire godowns at the mundi and rural level. Presently they have a hired godown capacity of 2.5 million M.T.[13]

Projected requirements of warehousing space for fertilisers:

Warehousing requirements for a commodity like fertiliser depdnds on a variety of factors. In a paper presented in March, 1978 in the Group Discussion on Fertiliser Promotion, Warehousing and Retail network,

N.P. Varma, Joint Commissioner, ministry of agriculture, Government of India,, estimated the requirement of storage space for fertilisers at 12.7 million tonnes by 1982-83. This figure does not take into account the storage capacity required at the factory sites and at ports for transit storage.[14]

In July, 1979, N.S. Parthasarathy of EID Parry (India) Limited, Madras estimated that the total requirement of storage space by 1983-84 for fertilisers would be 14.3 million tonnes.[15]

The Administrative Staff College of India, Hyderabad conducted a study on storage of fertilisers and brought out a report in December, 1980.

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13. Ibid.

14. Varma, N.P; cited by Chibber, O.N. op.cit; p.15

15. Parthasarathy, N.S; cited by Chibber, O.N; Ibid.

This report gives comparative estimates of storage requirements for fertilisers made by different agencies. To quote from the report,

> "The consumption of nutrients by 1983-84 is likely to be of the order of 83.55 lakh tonnes. In terms of material, it will be about 210 lakh tonnes. Warehousing facilities are required for storage and distribution of this quantity, buffer stocks, peak storage and for operational purposes.
>
> To have an idea of the macrolevel requirements of storage space for fertilisers, it would be safe to assume that (a) on an average there will be four turn-over and 70 per cent capacity utilisation through the year; (b) buffer stock will be of the order of 20 percent of annual consumption; (c) some quantity will require storage at more than one warehouse before reaching the consumer; and that (d) the capacity available at the factory sites and at ports for transit storage will be separate and a part of it will be available as a cushion to overcome any contingency of piling up of stocks. On this basis, storage capacity of about 140 lakh tonnes is required by 1983-84, the total requirement of warehousing space for an expected consumption of about 300 lakh tonnes of fertilisers in 1987-88 would be about 200 lakh tonnes".[16]

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16. Administrative staff college of India (ASCI) A study on storage of fertilisers, ASCI, Hyderabad. 1980.

Projected availability of warehouses for fertiliser storage

It is not easy to accurately estimate what part of the total warehouse space available at a future date in the country would be available for fertiliser storage. A rough estimate could however be made by analysing the projected growth of the warehouse capacity with the agencies that usually store fertiliser products.

FCI will require most of its additional storage space for the storage of food grains. As such, no significant increase in warehouse space need be expected for fertiliser storage from FCI in the near future. As regards agencies like CWC, SWC and cooperatives, a good part of the addition to their existing warehouse space, will be available for fertilisers.

O.N. Chhibber has made an estimate of the future availability of storage space for fertilisers, with the above mentioned agencies. Chhibbers estimates of capacity likely to be available in 1983-84 and in 1987-88 for storage of fertilisers with the various agencies is given in Table - 2.

TABLE - 2

Estimated availability of fertiliser storage with various agencies[17]

(in million M.T.)

Agency	Year	
	1983-84	1987-88
F C I *	2.0	2.0
CWC / SWC	4.0	5.6
Cooperatives	4.5	7.0
Others	1.5	2.5
Total :	12.0	17.1

The Sixth Five Year Plan has projected the additional warehouse availability in the country by 1984-85, the terminal year of the plan. But this availability is not for fertiliser alone. As was noted earlier, fertiliser has to compete with other commodities and get its due share out of the total available space. The additional storage space envisaged by the sixth five year plan is shown in Table 3.

17.. Chhibber, O.N; op.cit; p.14

* The figures in respect of FCI have been added by the research scholar to the table of Chhibber.

TABLE - 3

Additional storage capacity (by 1984-85)[18]

(lakh tonnes)

Agency	Capacity
Food Corporation of India	35.60 (excluding spill-over works of 10 lakh tonnes to next Plan)
Central Warehousing Corporation	16.00
State Warehousing Corporation	25.00
Cooperatives	35.00) 55.00
Rural Godowns scheme	20.00)
Total :	131.60

It can be seen from the above table that a fresh capacity of 55 lakhs M.T. is expected to come up by 1984-85 in the cooperative and rural sectors. Out of this 55 lakh M.T. of additional capacity targetted, a capacity of 13 lakh M.T. will be in the form of marketing godowns and 22 lakh M.T. in the form of rural godowns. The remaining 20 lakh M.T. capacity will be under another centrally sponsored scheme of rural godowns under which assistance will be given to market committees or State Warehousing Corporations or Cooperatives to build medium sized godowns in rural areas.[19]

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18. Planning Commission, Government of India; Sixth Five Year Plan 1980-85, New Delhi, 1980.p.111

19. Ibid; p. 181

Inventory carrying costs in the fertiliser business:

Inventory carrying costs constitute the third biggest component of the fertiliser marketing costs, next only to the costs of transportation and of dealer margins.[20] During 1982-83, the fertiliser business spent an estimated amount of Rs.257 crores on carrying the finished fertiliser products.[21]

The elements in inventory carrying costs:

There are several costs associated with the warehousing of any product. Some of them are fixed, others are variable and yet others are semi-variable, i.e. fixed in the short term but variable in the long term. The warehousing costs include godown rent, cost of maintenance and repairs, electricity, warehouse staff salaries, insurance, rates and taxes, stationery, postage and communication, handling, unloading and stacking costs, cost of packaging and labelling, if applicable, cost of transport incidental to warehousing, cost of capital tied up on the inventory, cost of deterioration and obsolescence of the inventory, cost of order processing and other administrative overheads. These costs apply to the warehousing of fertilisers as much as they do to the warehousing of any other product.

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20. Please see Chapter - 13, page 335

21. Please see page 268 below.

Interest is the most significant element in inventory carrying costs:

The most important of all these costs is the interest on the capital tied up in the inventory. Usually, any product arrives at a field warehouse in a 'high value added condition', after having incurred the manufacturing cost, the packaging cost and the transportation cost. As such, the value of the inventory as it arrives at the warehouse must be reckoned for the purpose of working out the interest cost on the inventory.

Estimate of interest cost in carrying the fertiliser inventory during 1982-83

As on 1-4-1982, an estimated quantity of 2.2. million MT. of nitrogenous and phosphatic fertilisers was being carried in stock in the country.[22] This was in terms of nutrients. In terms of material, it worked out to 5.5 million MT. In addition, a quantity of 0.5 million MT of potassic fertilisers was also held in stock as on 1-4-1982.[23] The total stocks of fertilisers as on 1-4-1982 has, therefore, to be reckoned at 6 million MT.

The above quantity is composed of a variety of products, whose prices vary from one another. The weighted average of the prices can be taken at Rs2200/- per MT. (consumer price less dealer margin). The work sheet for this calculation is given in Appendix-XXIV [24]. Assuming that the average inventory carried through out the year and the inventory on 1st April will be the same for the year under consideration - an year of slow sales and heavy

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22. Fertiliser News - December 1982, op.cit; p.110

23. Indian Potash Ltd., Madras

24. For details, please see Appendix XXV . p. 405

inventories, the inventory carrying cost will work out to Rs.257.4 crores. The working is shown below.

The value of inventory of 6 million MT. at the weighted average price of Rs.2200/- per MT. = Rs.1320 crores

Interest on Rs1320/- crores at 19.5 per cent per annum = Rs.257.4 crores.

In fact, the inventory must be valued at a much higher level than what is assumed above. For, subsidies to the tune of Rs.500 crores per annum is provided to these stocks by the Government of India. The prices reckoned here represent the real cost less subsidy. By the time the stocks reach the warehouses, they have already incurred the subsidy element. The appropriate step will, therefore, be to consider the value of the stocks including the subsidy for the purpose of working out the interest. In practice, it is difficult to allocate the subsidy over individual fertiliser products. If the subsidy is also taken into consideration, the total interest cost will workout to Rs299.2 crores.

Causes underlying the steep increase in the interest costs

There are several causes for the steep increase in the inventory carrying costs in the fertiliser business in the recent past. The most important among these factors are:

(i) The volume of fertiliser inventory per se has been going up. The level of inventory expressed as a ratio to sales has also been going up.

(ii) The prices of fertilisers suffered steep increases in June, 1980 and July, 1981.

(iii) The rate of borrowing of money from the banks has been going up equally steeply.

(iv) The expenditure on inventory carrying is getting duplicated to some extent. The distribution channels are shirking their role in inventory carrying though they are getting paid for this function. The manufacturers, are forced to carry the inventory; at the same time, they are also required to pay the full distribution margins to the channels. Thus the marketing system incurs the inventory carrying expenditure twice.

(i) Increase in the inventory level:

As was noted earlier, the quantity of fertilisers held in storage by the various fertiliser agencies in the country totalled up to 6 million MT. as on 1-4-1982. Estimates made by the Fertiliser Association of India show that the fertiliser inventory in the country as on 1-4-1982 was 80 percent more than the inventory as on 1-4-1981.[25] Both the pool and the domestic fertiliser industry seem to suffer the burden of heavy inventories. Fourteen domestic fertiliser firms, from whom stock figures as on 1-4-1982 were available, were holding q 1.4 million MT. of inventory. These firms were holding a total of only 0.87 million MT of inventory as on 1-4-1981. The increase during the financial year 1981-82 has thus been 62.4 percent.[26] The pool is understood to hold an

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25. Fertiliser News, December 1982, Op.cit. p.110

26. For details, please see Appendix XXV/, page 406

inventory of 2.5 million MT. as on 1-4-1982. Admittedly, in relation to the level of sales, the pool is holding a much higher level of stocks than the domestic fertiliser industry.

A number of reasons are cited for the high level of inventories with the domestic fertiliser industry as well as the pool. The highly seasonal nature of the business is no doubt the prime reason. This has already been explained. Certain other reasons for the relatively high level of inventories in the fertiliser business of India have also been explained in the same section.

The inherent uncertainty of the fertiliser business and the inadequacy of resources at the retail level is also cited as a reason for the high level of fertiliser inventory in the country. The uncertainty of fertiliser demand no doubt inhibits the smooth flow of the fertiliser stocks to the retail level ahead of the commencement of the season. As was noted earlier, there is increasing reluctance on the part of the distribution channels to hold the inventory on their account. Instead, they expect the manufacturers to do the stock holding. Institutional channels strive for larger purchases in the months when consumption is high and minimum possible purchases in the off season months. The private channels are not any better. They operate mostly on 'cash and carry' basis or on 'limited credit facility'. They have to pass on some credit facility to the consumers. Sometimes they have to wait till the crop is harvested for getting the cash back. Such an operation does not offer any motivation for the private channels to invest their money on off season inventory holding, in addition to meeting the normal credit requirement of the business. Thus, the off season inventories usually get stuck at the backward links in the long chain of distribution. The forward links at the retail level and semi-wholesale level seldom hold any off season stocks, except the unsold carry forward stocks, if any, of the previous season. Not only do they shun off season stocking, but they show no enthusiasm to stock the fertilisers even a month prior to the commencement of the season. They wait for the season to actually commence and in some cases for the season to demonstrate its good behaviour, before they start lifting the fertilisers from the wholesale outlets or the warehouses. The wholesale links in the distribution channel in turn show similar tendency, though not to the same extent as the retail and semi-wholesale links. This tendency is one of the main reasons for pushing up the inventory levels with the manufacturers. But this again does not explain the overall increase in fertiliser inventory in the country. This merely explains the shifting back of the inventory carrying responsibility from the distribution channels to the industry or the pool as the case may be. In other words, this merely explains why one limb of the business is holding the inventory instead of another.

Another reasor cited for the quantum increase in inventory in the country is the increase in domestic production of fertilisers. Fertiliser production in India went up from 10 million MT. in 1980-81 to 12 million MT. in 1981-82.[27] But this increase applies only to the domestic fertilisers and not to the imported fertilisers. In fact, the higher domestic production should have resulted in a cut back in imports and stabilization, if not a reduction in the total stocks of fertilisers held in the country. This does not seem to have happened.

Similarly, several reasons are cited for the high level of fertiliser inventory with the central pool. In the first place, the stocks with the pool are mostly buffer stocks, though it also includes the operational stocks meant for current sales to the pool handling agencies and the transit stocks at the ports, awaiting onward movement. The buffer stocks of the pool help tackle the fluctuations in fertiliser demand, protect the farmers against risks of inadequate supply and stablise the prices. They also help the nation to avoid distress purchases of fertilisers in the international market. Moreover, the pool has been assigned the role of a residual supplier of fertilisers in the country and the responsibility to meet any deficit in any state. It has the responsibility to step in, with the imported stocks, if any one or more of the domestic manufacturers fail to supply any state as promised by them. While these reasons may explain the need for a reasonable level of stock holding on the part of the pool, they do not explain why the stock levels with the pool should be as high as 2.5 million MT. especially when the domestic

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27. Fertiliser Statistics 1980-81 and 1981-82, The Fertiliser Association of India, New Delhi. pp I - 50-51 and I - 52-53 respectively.

production is good and the share of domestic production to total sales in the country is on the increase. They certainly do not explain why the inventory in respect of both the domestic fertilisers and the imported fertilisers is going up.

Perhaps, it is the market conditions in the fertiliser business that will properly explain why the overall inventory in the fertiliser business has been going up in the recent past. The increase in stock levels, has to be viewed as an indication of the fact that fertiliser consumption is not buoyant in relation to its availability. Of late, the agricultural operations have not been encouraging in several parts of the country. Under such conditions the inventory levels naturally go up.

Another reason for the high inventory is the absence of a systematic and coordinated approach to inventory management in the fertiliser business. The sales-inventory ratio in the business would have been far more encouraging if the domestic industry and the pool that handles the imported fertilisers, had together developed sound policies on fertiliser inventory and sound systems for its control. This aspect, will be commented upon in greater detail at the end of this chapter.

(ii) Increase in fertiliser prices:

Apart from the quantum increase and percentage increase in fertiliser inventories described above, the value of the inventories has gone up sizeably on account of the escalations in the prices of fertilisers. A couple of years back, the fertiliser prices were considerably lower. Within the thirteen months between June 1980 and July 1981, the prices of fertilisers went up by 62 percent.

In the case of urea, the most popular and the largest selling fertiliser, the prices have increased as follows:

Price increase in Urea

Price as on	Rs. per MT.
1-4-1979	1450/-
8-6-1980	2000/-
10-6-1981	2350/-

Similar increases have taken place in the prices of other types of fertilisers. Details have been furnished in Appendix - XIV.[28]

(iii) Increase in interest rates:

There has also been a steep and continuous increase in the interest rates in the country. The interest rate charged by the public sector banks of India on the cash credit availed by the fertiliser manufacturers went up from 13.5 percent in 1978 to 18.35 percent in 1980. The sequence of increases has been as follows:

Increase in interst rate on cash credit charged by SBI

Period	Interest rate (%)
From 1-3-1978 to 31-3-1978	13.40
From 1-9-1978 to 12-9-1979	14.00
From 13-9-1979 to 1-7-1980	17.00
From 1-7-1980 onwards	18.33

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28. For details, please see Appendix - XIV, p. 342 .

(iv) Duplication of inventory carrying expenditure

Presently the marketing system in the fertiliser business is compelled to incur the expenditure on inventory carrying twice. This is because, on the one hand the distribution channels shirk their role in inventory carrying. On the other hand, with the introduction of government regulated margins which came into effect from 15-8-1981 onwards, the manufacturers have no option but to pay the full distribution margins to the channels, whether they fulfill their responsibility for inventory holding or not. The regulated system of distribution margins is explained in detail later.[29]

The regulated margins cover the cost of inventory holding upto an extent. When the channels get these margins, it is incumbent on their part to bear the burden of inventory holding to the extent intended. But in actual practice, they do not discharge this responsibility to the extent intended. In other words, they get paid for the function without performing the function. The manufacturers actually hold the stocks and incur the expenditure thereof. This results in additional cost to the business on inventory carrying account.

As a combined effect of the four factors described above, the cost of interest in carrying the fertiliser inventory has gone up to Rs 292 crores in 1981-82. This is exclusive of the component covered in the dealer margins towards this purpose.

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29. Please see Chapter - 12, pp 304-307

Warehousing costs other than cost of interest

Next to the cost of interest, godown rent is a significant cost associated with warehousing of fertilisers. But it is a minor element compared to the interest cost. At the going rate of CWC/SWC hire charges for warehouse space, godown rent may amount to Rs five per MT per month. In addition to the rent, it may be necessary to reckon Rs one per MT. per month towards administrative cost associated with the warehousing function. On an average stock holding of 6 million MT. throughout the year the expenditure on these two heads for 1981-82 will work out to Rs 3.6 crores.

The cost of rebagging and standardisation and the cost of shortages incidental to storage does not appear to be a significant cost. The eight major firms, from whom data was forthcoming on this aspect through the survey, averaged a cost of fifty paise per MT. on this account on the total quantity sold in an year. On a sale of 15 million MT. in 1981-82 the total cost under this head can be put at Rs.0.75 crores. This cost might be more in the case of pool fertilisers where losses due to long storage can be of a much higher order than in the case of domestic fertilisers.

Handling costs at the warehouses and the cost of inward transportation to the warehouses and outward transportation from the warehouses are significant costs in the fertiliser business. But they are not considered under warehousing costs but under transport and handling costs, since in the nature of this business, these costs are incurred not on the basis of inventory levels or on the basis of the proportion of inventories to sales. Practically, the entire quantity of fertilisers produced and imported and marketed in the country suffers this cost. And this cost is the result of distribution and retailing practices rather than warehousing practices.

As such, this cost has been treated under fertiliser transport.

<u>The need to contain the inventory carrying costs:</u>

Since the fertiliser business is highly seasonal and the volume handled is enormous, the off season inventories would continue to pose a serious challenge to the business. As fertiliser consumption in the country goes up, year after year, the cost of carrying the inventory is bound to increase further. Every increase in fertiliser prices and every increase in the interest rates would aggravate the burden of carrying the inventory.

<u>'Systems approach' to control fertiliser inventory:</u>

It is obvious that inventory control as a marketing function, cannot be treated in isolation. It has no separate identity of its own. In the nature of things, decisions on inventories, transportation and distribution margins require a high degree of coordination.

It may be seen that in any physical distribution situation, the various distribution costs interact with each other. One element subsidises another. For example, if a firm is prepared to suffer increased cost on transport, it can possibly reduce warehousing costs. Likewise, increased distribution margins better credit facilities and increased transport rebates, to the channel would reduce warehousing costs. If the various distribution functions are considered in isolation, control may get fragmented. Worse still, each function tends to adopt a narrow view of the distribution objectives of the firm. The result is often sub-optimisation of the system.

Because of the inter-related nature of the functions and costs, decisions on warehousing must be taken on a total system basis, in alignment with the other components of the physical distribution function. In other words, a conscious effort should be made to view physical distribution as a single integrated system or a single unified function stretching from factory to farmer. This is the basis of the total cost approach or the total systems approach or the total efficiency approach to physical distribution. Such an approach does not treat warehousing as a separate or isolated function.

Basically, the inventory levels must be related to the inventory functions and the cost-benefit position of holding the inventories. A managerial approach to inventory carrying would mean the off-setting of the costs against the advantages of holding the stocks.

At the national level, the question to be answered is whether the contribution made by the fertiliser inventory to th country is more than what it costs the country to hold the stocks. Such a cost-benefit analysis may bring out the weaknesses behind the assumptions based on which the high level of buffer stocks of fertilisers is held in the country.

For individual fertiliser firms, economics of stock holding at micro level is important. One way of analysing it is the marginal cost approach, i.e.; whether every new warehouse produces some additional sales over and above the sales that would have been got in the territory without the new warehouse. As far as the individual firm is concerned, the additional sales must be such that it adds to the profits after meeting the costs of the new warehouse.

Optimum stock level in a given warehouse can be worked out with a reasonable degree of accuracy if the 'demand profile' in the warehouse territory is worked out reasonably accurately. In fact, accurate demand forecasting, especially at microlevel, is the key to proper management of the warehousing function. If the forecast could be broken down month-wise and fortnight-wise, a more thorough assessment of the stock holding requirements would be feasible.

The fertiliser business must apply all these measures and manage its inventories effectively. Unless inventory levels are kept under check in relation to sales, the costs of the fertiliser supply system will get pushed up still further in the coming years. Apart from effective inventory management, the business must evolve a way for avoiding the double payment of inventory carrying costs. The distribution channels must be made to discharge their duly approtioned share of the stock holding function. If they fail to perform that function, their distribution margins must be reduced. This is very essential if the total marketing costs in the fertiliser business have to be contained. This is elaborated further in the Chapter on Distribution margins.[30]

It is not enough if the domestic fertiliser industry alone improves its inventory management. The pool, which handles all the imported fertilisers must also practice sound techniques of

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30. Please see Chapter - 12, pages 319 & 320

inventory management and try to reduce the level of stocks. It is admitted that the pool has to maintain the buffer so that no shortage is allowed to develop in this commodity . But it should also ensure that no glut is generated in the market. Granting that there is some difference in the roles played by the stocks held by the domestic industry and those held by the pool, and giving due allowance to the respective levels of sales of the two agencies, the pool appears to hold much larger inventory than the domestic industry. The annual sales by the domestic industry is approximately thrice that of the annual sales by the pool. Since both the domestic industry and the pool are holding the same levels of stocks as on 1.4.1982, it can be inferred that the inventory-sales ratio in the case of the pool is thrice that of the domestic fertiliser industry. Since the pool is a part of the government activity, it does not feel the pinch of the inventory carrying costs in the same way as the various commercial firms engaged in the business feel it. Unless the pool stocks are also held under check through better planning of imports, the overall fertiliser inventory levels in the country could not be maintained at optimum level, avoiding glut conditions as well as shortages.

CHAPTER - 11

DISTRIBUTION CHANNELS

Importance of distribution channels in the fertiliser business:

Distribution channels play a decisive role in fertiliser marketing. The nature of the fertiliser business is such that without extensive channels of distribution the fertilisers will not flow smoothly from the factories to the farmers. The study reveals that most of the fertiliser firms in India have found it impracticable to undertake by themselves the channel functions. They have been depending heavily on the established distribution channels for carrying out the distribution job. In fact, most of the fertiliser firms consider the channel as the most important element of their marketing mix .

Characteristics of the fertiliser channels:

The study also reveals that the channel for fertiliser distribution in India is usually quite long. The fertilisers travel through two or three tiers of distribution before they are sold to the farmers. The study further reveals that the channel models used by the various firms in the fertiliser business vary widely from one another. Usually, it is the number of 'levels that distinguishes one channel from the other, though certain other characteristics also contribute,to a lesser extent, to the distinctiveness of the various channel models.

Classification of channels based
on the levels in the channels:

When a classification is made based on the levels in the channel three distinct channel types are seen in the fertiliser business of the country. They are:

(a) A single tier channel consisting of a net work of retailers serviced directly by the firm.

(b) A two tier distribution channel consisting of a net work of distributors and a second net work of retailers operating under the distributors. In some cases, the distributors are referred to as stockists or wholesalers.

(c) A channel pattern that involves one or more marketers or distribution houses between the firm and the wholesale/retail trade. In this pattern, the channel is usually structured into a three tier distribution outfit for, the marketer, himself may have a two tier distribution outfit as per pattern (b) above.

Quite a few fertiliser firms have adopted pattern (a) or (b). A few firms have adopted pattern (c). A good number of firms have embraced a pattern that combines the three types mentioned above. Usually, the firms having a combination of different channels types apply the different types in different marketing territories maintaining uniformity within a specified marketing territory.

The above classification of the channel based on levels in the channel applies only to the private trade. As far as channels in the cooperative sector are concerned, the classification based on levels is not quite relevant.

Classification of the channel based on
the nature of the channel members:

Leaving aside the number of levels in the channels, it is possible to classify the fertiliser channels based on the nature of the channel members. For example the channels could be classified into two broad categories - the private trade and the Cooperative outfit. But private trade outlets and cooperative outlets are not the only two types of channel members in the fertiliser business. Direct outlets of the fertiliser firms and outlets operated by the state governments are also distributing fertilisers in some parts of the country. It will therefore be appropriate to make the classification in a four-fold manner as shown below:

(a) Cooperative outlets
(b) Private trade outlets
(c) Direct outlets of the fertiliser firms
(d) Departmental outlets of the State Governments

The cooperative outfit has a fixed structure of its own. And the individual fertiliser firm has no choice but to use the channel pattern of the cooperatives as it is. In most of the states, cooperatives have a three tier structure with an apex federation at the state level and taluk societies and village societies at lower levels. The fertiliser firms have adopted their outfit as it is. The pattern of distribution followed by the cooperative channels in fertiliser business was described in some detail in Chapter 7.[1]

As far as the private trade is concerned, it is not bound by a rigid structure as the cooperatives are. Accordingly, the fertiliser

1. Please see Chapter-7, pp. 155-158.

firms have the option to follow either a two tier model or a single tier model of distribution when they operates through the private trade.

Distribution through company's own outlets is not practised in an extensive manner in fertilisers. Even in the few cases where the system is adopted, it is confined to the respective home markets. The problem of establishing a distribution net work totally owned and managed by the manufacturing firm is really stupendous, involving considerable resources and marketing overheads.

In some states, fertiliser mixtures - powder mixtures as well as granulated mixtures are still popular. The firms engaged in this business have developed a distribution outfit of their own. Often, these firms utilise their channels for marketing the fertiliser products of one of the other of the major fertiliser firms. Thus, the mixing firms form yet another distribution channel for the major fertiliser manufacturing firms. They, however do not constitute a separate category as they generally fall under the private trade.
In addition to the private and cooperative outfits and the fertiliser mixing firms, certain other institutional agencies like Agro Industries Corporations, cooperative sugar mills and private sugar mills also function as distribution channels in the fertiliser business.

Departmental sales outlets of the state governments are practically on the way out. Most states do not any longer use departmental outlets for fertiliser distribution. They rely, instead, on the cooperative outfit which, in a way, is a limb of the state set up.

Multi channel model is the order of the day:

From a survey of the channel policies of the various fertiliser firms, one conclusion is inescapable. The fertiliser business in India operates on a multi channel model. This is true of practically every territory in the country. This is also true of every fertiliser unit in the country. All the fertiliser units in India use the private as well as the cooperative out fit, as their channel. The study reveals that presently, the only exception to this rule is IFFCO which uses only the cooperative channel. The firm itself is a cooperative institution . Even this firm has in the recent past started feeling the pinch and has partially reversed its exclusive dependance on cooperatives. It has ~~started~~ using the agro industries Corporations into its distribution fold. In as much as the agro industries Corporation operate mostly through the private dealers, the products of IFFCO also will soon start flowing through the private trade.

It has thus become an inevitable characteristic of Indian fertiliser business that the channels of fertiliser manufacturers consist of both the private trade and the cooperatives.

The multi channel model has promoted ready availability of fertilisers in all parts of the country. It has also helped the farmers to obtain the fertilisers of their choice from the channel of their choice.

Multi brand dealership is the order of the day:

Just as the fertiliser firms have adopted a multi channel pattern in distribution, out fit the fertiliser dealers have also adopted a multi brand approach to dealership. The average fertiliser dealer in India today, is a multi brand dealer. This is true of the fertiliser dealers in the private sector as well as the cooperative sector. The age of the exclusive dealers seems to be over in the fertiliser business. In the early stages of the evolution of fertiliser marketing, some firms tried to develop a net work of exclusive or franchised dealers. It worked well for some time. But, over the years, the multi-brand dealers became the standard pattern in the fertiliser business in India, though, many dealers even now have their principal allegience to one brand and therefore could be termed as the franchised dealers of that particular brand. The present position of channel-brand practice in the fertiliser business is that it is neither so totally open as in the case of consumer items like cosmetics, or pharmaceuticals, nor is it totally exclusive and brand based.

The multi-channel approach to distribution, that has been adopted by most of the fertiliser firms and the multi-brand approach to dealership that has been adopted by a majority of fertiliser dealers, have served the interests of the farmers well. The wide open marketing environment has resulted in a basket of choices to the farmers. It has helped to provide fertilisers at competitive prices backed by competitive levels of service, offering a choice to the farmer in products and brands. The farmer can choose his brand based on his own perception of the value offered by each of the competing brands.

Extensive net work of
retail outlets:

Another noteworthy feature is that the distribution channels in the fertiliser business consists of a very large number of retail outlets. As on 31-5-1981, there were as many as 1,10,000 retail sales outlets in the fertiliser business in India.[2] The industry circles and the concerned government circles seem to be of the opinion that the number of outlets should be further increased in order to step up fertiliser consumption. This point will be discussed in detail in another context in this chapter.[3] It will be sufficient here to draw attention to the largeness of the net-work of retail outlets in the business. There are valid reasons for the large number of outlets in the business.

Fertilisers have to be made available practically in all the six lakh villages in the country. This means that the distribution channels has got to be very extensive. Secondly, all the firmsin the fertiliser manufacture have xx large capacities of production. This means that each firm must have a wide market spread to offload its production. Wide market spread necessarily implies a very large net work of outlets. Thirdly, the size of agricultural holdings in India is characteristically small and the number of consumers to be contacted for selling the fertilisers is very large. This again implies large and scattered net work of dealers, each handling a large number of small sized clients.

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2. Fertiliser Statistics - 1980-81, The Fertiliser Association of India, New Delhi, p.I-77

3. Please see page 299 below.

<u>Functions performed by the distribution channels in the fertiliser business:</u>

The distribution channels in the fertiliser business are expected to perform a variety of functions. No doubt, there is a gap between the expectation and the actual performance. In respect of some functions, the gap between expectation and performance is very narrow. In the case of some other functions, the gap is very large.

The fertiliser firms expect their distribution channels to perform all the standard distribution functions, normally expected of any distribution channel engaged in mass marketing. In addition, they expect their channels to perform certain special functions which cannot be termed as standard distribution functions. The latter arise on account of certain unique features of the fertiliser business. These unique features were discussed earlier in some detail.[4]

It was pointed out that the fertiliser business differs from that of most consumer products and intermediate products. The role and functions of the distribution channels in the fertiliser business differ correspondingly from the role and functions of the channels in other businesses.

In view of the highly seasonal nature of the fertiliser business, the distribution channels in the fertiliser business has to play a crucial role in offseason stock holding. Since credit is an integral

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4. Please see chapter-7, pp.113-128.

part of the fertiliser business, the distribution channels in this business has to be capable of fulfilling the credit needs of the customers.

The most significant among the special features of the fertiliser distribution channels is that the distribution channels in this business cannot stop with distribution or with distribution plus after-sale service. They have to act as 'change agents' in the farm economy of the country. A fertiliser dealer does more than just the selling of a mere product or a service. He is actually selling a new technology which results in bringing prosperity to the farmer. The technical guidance needed by the farmer for growing the crop in a scientic way has to come from the fertiliser dealer.

This implies a considerable enlargement of the functions of the channel in the marketing of fertilisers business. A fairly exhaustive list of the standard and special functions, expected of the channels in the fertiliser business is given below:-

- Breaking the bulk and catering to, the small size purchases by individual farmers.
- Assembling different fertilisers into suitable assortments that are acceptable to the farmers.
- Sub-distribution
  - (a) Selling to retailers
  - (b) Retransport
  - (c) Handling (inward and outward)
  - (d) Accounting

— Stock holding

(a) Financing the stocks
(b) Risk bearing
(c) Making available warehouse space
(d) Keeping the stocksclose to the actual users and thereby aiding the sales.

— Providing sales-manship

— Providing service - presale and after sale

— Assisting in sales Promotion

— Help in establishing new products in the market

— Aiding the price mechanism between the principal and the customers.

— Communication and feed back (reporting/market intelligence service)

— Maintenance of records/registers

— Liasion

— Extending credit to retailers and actual users and arranging credit facility to them from other sources of credit.

— Transferring the technology of modern farming and acting as change agents among the farmers.

It must, however, be remembered that all the fertiliser firms do not expect their distribution channels to perform all these functions. While there are a number of commonalities among the various firms in their expectations regarding middlemen functions, there are also some variations in this matter from firm to firm.

Firms like Coromandel Fertilisers (CFL), Madras Fertilisers (MFL) and Mangalore Fertilisers (MCF) who operate through State level marketers, entrust to their marketers a wide range of functions including extensive responsibility for stock holding, financing, risk-bearing, promotion, communication, liaison etc. Firms like FACT, FCI, GSFC, Zuari, IEL and Sri Ram allow to their dealers only a relatively limited set of functions mostly relating to re-distribution. The very designations given to middlemen - 'marketer' in the case of CFL and MFL and dealer in the case of FACT and FCI - are indicative of the roles and functions expected of them.

Establishing a dealer net work:

From the description of the importance of the distribution channels and the variety of functions expected of them in the fertiliser business, it will be clear that the creation of a well knit dealer net work and effective management of the net work holds the key to successful fertiliser marketing. The present study has revealed that the fertiliser firms in India appreciate this requirement very well. They also appreciate that as far as possible, the dealer net work should form an integral part of the firm, though for reasons of convenience, in some cases, they are satisfied with an indirect dealer net work, i.e. a dealer net work made available to them by a large marketing intermediary.

Greater flexibility for the manufacturers for building a net work in the private trade:

As mentioned earlier, in the matter of channel design and establishment of retail net work, the fertiliser firms have a free hand only in the private trade component of the channel. As regards the cooperative component of the channel, the fertiliser firms have to accept, as it is, the cooperative net work that is available in the different states.

In managing and administering the channel too, the fertiliser firms have comparatively greater freedom with the private trade component and lesser freedom with the cooperative component. But, as regards training, motivation and development of the channel members, the firms enjoy almost equal scope with both the sectors.

Single tier vs. two tier channel types:

Basically, the establishment of a dealer net work involves two steps - the choice of the appropriate channel type and the selection of the individual dealers.

As regards the first step and as regards the private trade component of the channel, the fertiliser firms have the options of a single tier and a two tier models of outlets. The two patterns are presented elsewhere in two charts.[5] There are advantages as well as disadvantages in both patterns. The balance of advantage seems to lie with the single tier system.

The main disadvantage of the two tier system is its lower profitability to the dealers, as the available dealer margin has to be

5. Please see Appendix - XXVII page. 407

shared between the wholesaler and the retailer. Also, exercising discipline and control over the two tier outfit is more difficult than over a single tier outfit.

The main advantages of the two tier system are quick out flow of stocks from the manufacturer's warehouses and an intensive coverage of the market. These two advantages are based on the assumption that sufficient stock holding will be done by the wholesaler in the two tier model.

However, in practice, in several cases, the whole sale ~~kexxxk~~ sale points do not stock the products adequately though stock holding and sub distribution are their primary functions in the two tier model. In such cases, the two tier system loses its main advantage, while retaining the disadvantages of higher distribution costs and shared dealer margins by the two tiers in the system.

The single tier system also has some advantages and some disadvantages. Elimination of a tier brings some savings in distribution cost and results in higher profitability to the dealers. Further, double transport and double handling can be avoided by opting for a single tier outfit. Direct servicing of the outlets by the manufacturer is yet another welcome aspect of the single tier outfit. Profitability, being the main consideration of the dealer for pushing up the fertiliser sales, the single tier system has a major merit in dealer motivation.

A main disadvantage of the single tier system is that it cannot cover the interior markets as effectively and deeply as the two tier net work can. Also, the manufacturer, in a single tier system should be able to perform by himself the functions that were normally the responsibility of the wholesale middlemen. He will also have to increase the number and spread of his field storage points to make up for the absence of the wholesale tier in the channel.

It is evident that the choice between a two tier and a single tier system of dealers has to be made after studying in detail the associated merits and demerits of the two alternatives in the specific context of the marketing objectives and requirements of the given firm. The choice has to be made with great care since many other marketing decisions depend on the decisions already made on the design of the channel and the number of tiers in the channel.

Number and location of
retail outlets:

The number and location of the sales outlets is another important area for decision making in fertiliser distribution. As pointed out earlier, as a general rule, a large number of sales outlets will be necessary and desirable in the fertiliser business as it has to serve a very large number of consumers scattered throughout the country. At the same time, the outlets cannot be multiplied indiscriminately, for they may become unviable.

The sales outlets have to be so located as to afford operational convenience to the firm, the dealer and the consumer. Ideally, the consumer should find it possible to buy their requirements without having to travel long distances. In other words, the sales outlets should be able to literally carry the fertilisers to the door steps of the farmers. This will mean a minimum of one outlet in each village in the country and more than one outlet in big villages. But, from the viability angle, the number of outlets has to be a function of the level of current sales and the potential of the territory. Another main consideration in the location of the outlets, is the availability of transport facilities from the nearest warehouse of the manufacturer or the whole sale distributor. Likewise, availability of roads and transport facilities from the retail location to the villages to be served by the outlet is also an important consideration.

Thus, four factors, viz. convenience in delivery, volume of business, economics of operating the outlets and the locational suitability have to be considered while deciding upon the number and location of the retail outlets.

The role of the individual dealer:

Once the decision on the channel pattern the number of tiers in the distribution outfit, and the number and location of the retail outlets have been taken, the selection and appointment of the dealers at the various points are to be done ~~xxx~~. This is a crucial area in the fertiliser business. The individual dealer plays a critical role in the fertiliser business.

A characteristic feature of the fertiliser business is that it is the dealer who actually sells the product not the company's salesmen. The latter merely stimulate, enthuse and activate the dealers. The individual dealer in effect is the pivot in the fertiliser marketing effort.

In the mundi towns and in the interior villages, the individual dealer is a force to reckon with. And, it is through the dealers in the mundi towns and interior villages, fertilisers get sold. The

fertiliser dealer exercises a good deal of influence on the decision making process ~~involved in the purchase of fertilisers~~ by the farmers.

Most of the fertiliser firms have appreciated this fundamental fact of their business. They do not consider their dealers as mere 'outlets' from where their products flow out. They assign their dealers a role in market penetration, market development and sales promotion. Their goals of increased market coverage and market share are realised mostly through 'dealer management'. A great deal of competition is seen at the dealer level inthe fertiliser business. Marketing success or failure of the firms is made at the dealer level. And on the strength of the dealer depends the strength of the marketing organisation.

Selection and appointment
<u>of dealers:</u>

The fertiliser firms in India, aware as they are of the important role played by the individual dealers in the business, evince great care in the selection and appointment of their dealers. They expect a variety of qualification on the part of the dealers. Some of these qualifications are the standard ones that are required of any dealer. Some other qualifications are unique to the fertiliser dealer. Business capacity, financial strength, credit worthiness and ability to sell to the rural customers are usually looked for in the prospective fertiliser dealers by almost all the firms.

One seldom comes across a fertiliser dealer possessing all the attributes that are desired. The fertiliser firms, through training and development, make up the deficiencies in the dealers and build them up into a strong and effective network of distribution.

In as much as the fertiliser business involves high capital investment with a relatively low return on capital, the fertiliser firms often find it difficult to woo sufficient number of competent and financially sound business men as their dealers. They recognise this reality and make the necessary compromises. They do not shut out any one who shows the potential to be a fertiliser dealer.

Dealer management,
dealer motivation and
dealer training:

Creation of a good dealer network through careful selection of individual dealers is but one part of channel management. An equally important part of this job is the management of the dealer network. Dealer management will include dealer servicing, dealer administration, dealer compensation, dealer motivation, dealer training and dealer development.

The fertiliser firms do recognise the importance of each one of the above mentioned tasks of dealer management. But, in respect of the most important task in this field, viz. the determination of dealer compensation, the fertiliser firms do not have a free hand.

In 1981 Government of India introduced a system of statutory distribution margins in the fertiliser business. The freedom hitherto available to the firms in this field has been taken away by the government move. This aspect is being dealt with in detail subsequently.[6]

It was mentioned earlier that in the fertiliser business, the war for sales is fought and won at the dealer level. Evidently, better administration of the dealer, better communication with them better motivation and training of the dealers and the resultant superior loyalty of the dealers to the particular brand holds the key for winning the market. A firm that is superior in dealer management usually gets the bigger slice of the cake.

Viability of retail outlets:-

Earlier, in this chapter, it was mentioned that the channel in the fertiliser business involves a very large and extensive net work of retail outlets. As was noted earlier there are as many as 1,10,000 retail outlets in the fertiliser business of India as on 31-5-1981.[7] But, the industry circles and the concerned government circles are of the opinion that the existing base of retail outlets is inadequate. They also feel that the current rate of growth in retail outlets is also inadequate. Between May,1977 and May 1981 the retail outlets in the fertiliser business expanded from 96,200 to 1,10,000, an increase of 14,000 outlets or an annual growth rate of 3.6 percent in the four year period.[8] In the

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6. Please see chapter-12, pages 304-307.

7. Please see page 287, below.

8. Fertiliser Statistics 1980-81 & 1977-78; op.cit; p.I-77

opinion of the industry and government circles, the base of retail outlets must be enlarged rapidly and a good annual rate of growth in the outlets must be maintained if the planned expansion in fertiliser consumption is to materialise.

Another point that is often mentioned in this regard is that apart from the inadequacy of the base and the rate of growth of the retail outlets, even the existing network is not uniformly spread out over the entire country. The outlets are generally clustered in areas that are easily accessible and areas where the fertiliser demand is assured. Again, there is clustering of outlets at railhead towns The interior parts that are away from rail heads do not have adequate outlets. One main reason for such clustering of outlets at railhead-towns is the fact that, till recently, fertilisers were supplied to the sale points on F.O.R. railhead basis, freight paid upto the nearest railhead. Any additional freight incurred by the outlets for taking the fertilisers to places away from the railheads had to be met out of the distribution margins available to the outlets. There was no incentive or motivation under such dispensation for opening outlets in the interior parts. This factor has been taken care of to an extent by the recent change in the policy regarding delivery of fertilisers. The change in the policy has been described elswhere.[9]

The present position is that, nearly 110,000 retail outlets have to cater to nearly six lakh villages in the country, each outlet

9. Please see Chapter-9, pp. 214-216

serving on an average five or six villages. Since, the 110,000 outlets are not uniformly distributed all over the country, but are clustered at the rail-head towns and mundi towns, in effect, a single outlet has to serve ten or twelve vollages in many parts of the country.

The case for increasing the number of retail outlets and spreading them out to the interior parts is certainly strong. Experience has shown that supply push rather than demand pull has stimulated fertiliser consumption in the interior parts of the country. While fertiliser consumption, in general, has been a function of availability in all parts of the country, it is particularly true of the interior parts where the availability had been a constraint for a long time.

But there is an equally strong case against indiscriminate expansion of retail outlets. For, adequacy and spread of retail outlets are but two aspects of the problem of retail outlets in the fertiliser business. A third aspect, which is in fact, the most important aspect to be taken into account in this matter is the viability of the outlets.

Many of the retail outlets in fertilisers suffer from poor viability. They are unable to achieve a reasonable level of profit from the business due to poor sales volume. Any expansion in the number of retail outlets, without commensurate expansion in the total fertiliser consumption will make further inroads into the viability of the outlets.

Apart from the lack of adequate expansion in sales, the escalations in the stock holding costs also adversely affects the viability of the retail outlets. Without holding a reasonable level of stocks the retail outlets are unable to achieve a viable sales volume. In the context of escalating prices of fertilisers and escalating cost of credit, the outlets find it difficult to hold a reasonable level of stocks.

Improving the viability of the retail outlets is today a more pressing requirement in fertiliser retailing than expanding the number of the outlets, which might complicate the situation further.

There is a conflict here between the quantitative expansion of outlets and the viability of the outlets. If the total business does not ~~xxx~~ expand increase in the number of outlets will further worsen the ~~xxxx~~ viability of some of the existing outlets. Viability will improve, on the other hand, if the quality of the dealers is improved or if the remuneration of the retail outlets is enhanced. An unavoidable feature of the fertiliser business is its inherent uncertainty. While xxx fertiliser dealers at all levels suffer from the frequent fluctuations in the variables affecting their business, the impact of these changes on the retail outlets is all the more severe.

The quantity of fertilisers sold per retail outlet in 1980-81 works out to 80 M.T. in terms of nutrients or 200 M.T. in terms of products.[10] Such a level of sales may not be considered as attractive by many retail outlets.

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10. Jayakar. K.P; " Viability of dealers," paper presented at the Fertiliser Association of India (FAI) Seminar, December 1980 New Delhi. p.iv. 5.

But, a more serious problem is that many retail outlets do not have a business in the range of 200 M.T./in an year.

K.P. Jayakar says, "A recent analysis of our dealer net work revealed that as many as 40 percent of the dealers were in the annual offtake group of below 50 tonnes. It is evident that with such a low offtake, the dealership can hardly be termed viable and there is really no incentive for the dealer to continue in the business".[11]

This does not however mean that the number of retail outlets should be frozen at the existing level for sometime to come. There is certainly need for expansion especially in the interior and in the unpepresented parts. The new policy of delivering fertilisers at the blocks may help to an extent, the expansion of retail outlets in the interior parts.

Puri says,"As fertiliser demand picks up in the interior, there will be a greater incentive to open more retail outlets. The decision to deliver fertiliser upto the block headquarters and to make distribution margin operational only from the block headquarters onwards is likely to act as a great incentive to open retail outlets or retail suboutlets in the interior".[12]

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11. Ibid.

12. Puri, S.S; "Marketing challenges in the eighties", paper presented at the Fertiliser Association seminar, December 1980, New Delhi. p.v.6.

Channel compensation:

The fertiliser business incurs a heavy expenditure towards channel compensation. The compensation is paid mainly in the form of distribution margins and credit facilities. Cash rebates are extended in lieu of credit. The compensation package also includes a variety of special rebates and discounts.

The survey of the industry conducted as a part of this research shows that the margins paid to the channel form the second largest component of the marketing costs in the business.[12] If the various special rebates that are extended to the channels in addition to the regular distribution margins are also considered, channel compensation may even occupy the first position, among all elements of marketing costs, overtaking even the cost of transportation.

The fertiliser business incurred an estimated Rs. 147 crores towards channel compensation during 1980-81.[13] This includes the distribution margins as well as the cash equivalent of the credit facilities extended.

The expenditure on this account during 1982-83 was substantially larger than the amount spent during 1980-81, both in absolute terms and in the amount spent per unit quantity of fertiliser distributed.[14] This was so because of (i) the substantial adhoc increase in margins introduced by the government with effect from 15-8-1981 and (ii) the various special rebates extended by the firms to the channel during 1982-83 to promote sales under glut conditions.

The subject of channel compensation is examined in detail in a separate, chapter in view of its importance and complexity.[15]

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12. Please see chapter-13, page 335

13. For details of calculations, please see Appendix XXVIII, 408.
14. See Appendix. XXIX, p. 409
15. Please see chapter-12,

C H A P T E R - 12

DISTRIBUTION MARGINS

The meaning of distribution margins

The term 'distribution margins' in the fertiliser business signifies the discounts and commissions passed on to the distribution channels. It does not signify the overall distribution costs, for a sizable part of the total distribution function is performed directly by the fertiliser manufacturers at their cost. This cost is outside of the margins paid to the channel. Expressions like 'trade discounts', 'dealer margins' and 'channel margins' will be more apt for describing the compensation paid to the distribution channels in the fertiliser business than the expression 'distribution margins'. But, in this dissertation, the expression 'distribution margins' is being used to denote the trade discounts passed on to the channel since this happens to be the accepted parlance in the fertiliser business. Occasionally, expressions like, 'dealer margins', 'channel margins', 'channel compensation' 'channel remuneration', etc. are also used. All such terms are used in the synonymous sense and all of them signify 'distribution margins' as understood in the fertiliser business.

Introduction of 'administered distribution margins:-

With effect from 15-8-1981 the Government of India introduced a new system of 'mandatory' or 'administered' distribution margins in the fertiliser business. While the fertiliser industry in India had almost always lacked freedom in respect of pricing, it had till recently enjoyed full freedom in the matter of fixing distribution margins.

When the fertiliser prices were put up with effect from 7th July, 1981, the distribution channels, especially the institutional channels intensified their demand for an increase in the margins. The Government of India appreciated this demand, but were not clear as to how the question of margins should be handled. They did not have with them a comprehensive formula on distribution margins. They were not sure as to the quantum of increase that should take place in the margins, and the norms that should govern the fixing of the margins for different fertilisers. Nor were they clear as to how parity in this regard was to be established among the different manufacturers selling the same product but under varying systems of marketing. The government therefore shelved the overall question and announced an upward revision of margins on a purely 'ad hoc' basis with effect from 15-8-1981. It is this announcement or margins that ushered in the new system of administered margins taking away the freedom hither to enjoyed by the fertiliser manufacturing units in the matter of distribution margins. For in the earlier period, whenever the government revised the distribution margins the revisions were confined to the imported fertilisers which were marketed by the government. It was with effect from 15-8-1981 that for the first time, the government started fixing the margins for the domestic fertilisers.

1. Government of India, Ministry of Agriculture Notification No. 1-15/81-FA(P & C) dt. 14-8-1981, New Delhi. p.1.

As per this notification of margins, the government fixed the margin in respect of each domestic fertiliser product coming under the retention price system as well as each fertiliser product that formed a part of imports. The same margin was fixed for a given product irrespective of whether the source of supply was the pool or any one of the several firms in the domestic industry. The notification also stipulated that the institutional channels shall be paid larger margins than the private trade for any given product. The government actually brought in two separate sets of margins - one applicable to the institutional channels and the other to the private trade. A differential of Rs 20/- per tonne between the margins to the institutional channels and those to the private trade was maintained.[2] This differential was applied at the uniform rate to all the fertiliser products, irrespective of their prices and other factors.

The new set of distribution margins contained certain anamalies Some of the firms found that the new set of administered margins meant, in effect, a reduction from the level of margins allowed by them to their channel prior to the revision. To rectify such anomalies within two and a half months of the introduction of the administered margins, the government brought in a revised set of administered margins for some products with effect from 13-11-'81. And this revision in the margins was made not because of any revision in the prices of fertilisers. The prices remained the same, but the

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2. Ibid.

government revised the margins by way of rectification of anomalies in the margins notified earlier. The rectification created a fresh set of anomalies. For, as per the second revision, in the case of some fertiliser products, different margins were fixed for different firms for the same product. In the case of urea and DAP however, the same margin was continued for all firms.

The set of margins that came into effect from 15-8-1981 are presented in Appendix- XXVIII.[3] The set of margins that came in to effect from 13-11-1981 in respect of five products are presented in Appendix - XXIX[4].

Recent controversies relating to distribution margins

Presently acute controversies seem to be raging on four distinct aspects of fertiliser distiribution margins. They are:-

(i) should the government regulate the distribution margins?

(ii) should there be a difference between the margins paid to the institutional channels and those paid to the private trade?

(iii) Is the present quantum of margins right or excessive or low?

(iv) If the government should regulate the margins, should the regulated margins be the 'floor' margins or the 'ceilings'? And how could the individual firms be prevented from a margin war and the resultant unhealthy competition and market malaise?

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3. Please see Appendix - XXX - p 410.

4. Please see Appendix - XXXI p. 411.

It is essential to examine each of these aspects in some detail.

(i) Should the government regulate the distribution margins?

The prime controversy on distribution margins relates to the role of the government in the matter. At no time, prior to 15-8-1981 the government seriously considered the introduction of 'mandatory' margins for domestic fertilisers. The margins for these fertilisers had always been 'normative' or 'recommendatory'.

The notifications on margins of the government were confined to the fertilisers marketed by the pool. Since these fertilisers were marketed by the government, it was natural that the margins and terms of sale in respect of them were fixed by the government. Domestic fertiliser firms were fixing the margins for their products as per their respective marketing policies and arrangements. However, a number of domestic firms were, on their own accord, adopting for the sale of their products, the same terms that were offered by the pool/government. Such matching was however confined to the sales made by them to the institutional channel. It was also confined to two products viz Urea and D.A.P. It was done as a voluntary response by the firms to the market requirements and not for meeting any governmental requirement. As against this, the new system of administered margins enjoined on all the firms to offer the government notified margins in respect of all products and in respect of the institutional as well as private components of the distribution channel.

Even the various committees such as the Sivaraman Committee (1965) the National Commission on Agriculture (1972) and the Quraishi Committee (1973) that studied the subject of margins earlier did not consider it necessary to make the margins mandatory. They merely indicated certain normative margins.[5] It is not clear as to what objective considerations motivated the government to specify by notification the margins to be paid in the case of domestic fertilisers with effect from 15-8-1981. While regulation of prices of fertilisers has a lot of merit, the same does not seem to be true of regulation of distribution margins. The initial steps of the government in this regard have been quite confusing, confirming the apprehension that administered margins will hamper distributional efficiency and inflate the costs of the fertiliser supply system in the country. This aspect will be examined in more detail later.[6]

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5. A reference to Sivaraman Committee was made earlier. Please see Chapter - 7, p. The National commission on Agriculture was appointed by the Government of India in 1972 to study the various aspects of agricultural development. It investigated the role of fertilisers in Indian agriculture and discussed the various aspects of fertiliser marketing including distribution margin. Refer Government of India Ministry of Agriculture and Irrigation, Report of the National Commission on Agriculture, New Delhi. 1976. In 1973 the Government of India appointed a committee under the Chairmanship of Sri M.A. Quraishi to go into the details of distribution margins payable to the cooperatives for marketing fertilisers. The Quraishi committee gave its report in 1973. Refer. Government of India, Ministry of Agriculture, Report of the Qurashi committee (unpublished), New Delhi. 1973.

6. Please see pp. 322-327 below

(ii) Differentiation between institutional and private channels, in the matter of margins

As was noted earlier, the government has stipulated that there shall be a differential of Rs 20/- per tonne between the margins applicable to the co-operatives and those applicable to the private trade. The government has not come forward with any logical explanation for the differential treatment.

It does not seem rational to demand or to confer preferential distribution margins merely on sectoral considerations. On the other hand it seems both rational and fair that the private trade and the co-operatives are treated on par and given the same distribution margins, so long as they do identical distribution job and perform the same set of distribution functions. It is argued sometimes that the cooperatives discharge the stock holding function better and therefore they should be paid a higher distribution margin. The realities of the fertiliser business, however expose the illogicality of providing a higher margin to the cooperatives on the assumption that the cooperatives share with the manufacturers the burden of stock holding. If the cooperatives are truly giving such relief, then the logical step will be to compensate the cooperatives separately for the stock holding function and pay equal margins to both the private trade and the cooperatives for the remaining functions. It also follows that if stock holding is done by the private trade too, then they should be remunerated for that function, without any discrimination between them and the cooperatives based on sectoral consideration.

In earlier years, another argument was also being put forth that the cooperatives were taking the fertilisers to the interior parts and that they should be compensated for the additional cost incurred by them in this regard through a higher distribution margin. With the introduction of the block level delivery of fertilisers, transport upto block level has been provided for under the head of freight and therefore it is no longer logical to mix it up with distribution margins. In other words, the only argument that was earlier cited by the government in justification of a higher distribution margin for the institutional channels also ceased to be valid in the changed context. Yet the government continues the special treatment to the institutional agencies.

Just as it looks illogical to offer differential margins to the channels based on sectoral consideration, it looks equally illogical to allow differential distribution margins on the basis of the nomenclatures borne by the channel such as marketer, stockist, distributor, wholesaler, retailer, dealer, etc. Though the names indicate in some measure the attributes of the particular intermediary, distribution margins cannot be conferred on the intermediaries blindly based on their nomenclature.

(iii) Controversy over the quantum of margins

No one in the fertiliser business denies the fact that distribution margins must be reasonably attractive if fertiliser sales have to be pushed up substantially, Without attractive distribution margins the overall objective of sustained growth in fertiliser consumption would not be realised. Nor the manufactures would be able to market successfully their current production of fertilisers. And provision of attractive margins applies equally to the private and cooperative channels of fertiliser distribution.

At the same time, the country cannot afford to fix the distribution margins at too high a level. Unhealthy price war and inefficient marketing are the consequences of giving away more than what is necessary as margins. Moreover, in the case of the fertiliser business, the funds required for paying the margins have to come from the public exchequer in the form of subsidy under the retention price system. The alternative to government subsidy will be an enhancement of the prices of fertilisers to meet the increase in distribution margins. This may not be expedient either. The need for containing the dealer margins will thus be evident. The institutional channels almost always clamour for a higher quantum of distribution margins. The government seems to have a soft corner for the institutional agencies. The private trade is attempting to join the band wagon of the institutional agencies and to get higher margins either on par with the institutional agencies or at least at a level that is only Rs.20 per tonne lesser than the margins applicable to the institutional agencies. The manufacturers are understandably, not happy to pass on higher and higher margins to the channel, whether private or institutional, without pinning them down to the performance of the intended distribution functions. They are often forced to take upon themselves the most important distribution function, viz. the stock holding function, to a very large extent. They do not find any justification for giving higher margins to the channel whether cooperatives or private.

And, as mentioned earlier, in the existing system of pricing and subsidies, the public exchequer has to bear all the expenditure. Neither the fertiliser manufacturers, nor the channel nor the farmers who are the ultimate consumers of fertilisers would be willing to bear this cost. From this angle, the government too cannot be particularly happy to escalate the margins. If only it can find satisfactory answers to the demand for increased margins, and contain the pressure, it should be happy to hold on to the present levels of margins.

What is required is an objective and thorough study of the problem of dealer margins and fixation of reasonably attractive margins on the basis of the study, containing the pressures for unreasonable increases in the margins. It appears that the Government of India does recognise the need for a thorough review of dealer margins in all its aspects. They have directed the Fertiliser Industry Coordination Committee (FICC) to study the distribution margins and marketing costs in the fertiliser business. The FICC has in turn engaged a consultant for this purpose. The consultants, Fertiliser (Planning & Development) India Ltd; (FPDIL) are yet to complete the study and submit their report.

(iv) Granting of excessive margins by some firms - should it be curbed by the government?

Fertiliser firms in the country are placed today in the unenviable position of having to fight out a margin war. They are required to offer to the change not only the full quantum of the notified margins but are required to extend additional compensation to them in various ways in view of competitive conditions and market glut.

According to one school of thought if the market forces will determine the level of margins and incentives to be offerred to the channel, the government need not make any attempt to regulate the margins in the business. Their argument is that under the present circumstances, on the one hand they are required to extend the notified margins to the channel whether they are justified or not in a given set of conditions and on the other hand, they have to pay out to the channels something in excess of the due margins whenever there is a slackness in demand. They also raise the question as to why the notified margins should not be kept at a much lower level allowing competitive forces to take over and determine the real levels of margins in a given context. The validity in the argument can be appreciated especially when one remembers that the notified margins in effect flow from the public ex-chequer. The real issue is why should the fertiliser marketing system be allowed to add to the drain on the public exchequer?

According to another school of thought the government having started its interference with the margins must take upon itself the responsibility for ensuring that no fertiliser firm pays to the channel anything in excess of the government notified margins. In other words they want that the notified margins should be enforced as the ceiling margins and not as floor margins. They point-out that by effectively curbing the unhealthy practices in margins, national interests as well as the health of the industry could be protected. But it seems impracticable to assign to the government the role of ensuring that no firm pays to the channel anything more than what is legislated. In the first place such a role on the part of the government will cut at the very roots of the competitive existence of the industry. Secondly, it may not be feasible for the government to take up such a monitoring role. However the issue involved is serious enough and requires a solution. It raises the question as to why government should notify minimum distribution margins in a business where the ruling practice anyway is to pay substantially more than the government notified margins. It also gives rise to doubts regarding the wisdom of extending state subsidies to a business that can afford to pay more margins than what is envisaged by law. The related aspects have to be studied in depth.

A 'Functional approach' to distribution margins

It seems that most of the current controversies on distribution margins in the fertiliser business will get resolved if a functional approach to the issue is taken. After all, margins are paid to the channels in consideration of the functions performed by the channels. If the preconceived notions about the sectors and types of the channels are shed and a functional approach is applied, it will be easy to evaluate the comparative roles of different channel types and different channel sectors. In fact, with the functional approach, one can completely forget the sectors, the types and the nomenclatures of the channels and directly relate the channel margins to the channel functions that are actually performed by a given type of channel or a given level within a given channel type. In fact, the functional approach to channels, has two major advantages. In the first place, by such an approach, the distribution functions could be rationally allocated between the principals and the channel. And those functions that are allocated to the channel could be further rationally divided over the different levels in the channel. Secondly, the remuneration that is available could be allocated to the different levels in the channel in proportion to the distribution functions that are actually performed by the particular level.

Functionwise break-up of margins:

An analysis of distribution margins should normally bring to the fore the specific distribution functions that are sought to be compensated by the margins. However, the data coming forth from the domestic industry does not suggest a direct relation-ship of the channel margins to the channel functions. But, the pool has made some attempt to relate the margins to the functions. The present distribution margin in respect of pool urea is Rs 140 per tonne (to the institutional channels). This margin is a consequence of an adhoc increase of Rs 25 per tonne over the level that existed prior to 15-8-81. The pool has not spelt out the break up of the revised margin since, in their view, it is purely an adhoc increase, pending finalisation based on an objective review of the functions and costs. The break up of the pre-revised margin in respect of pool urea is shown in Table -1 below.

Break up of distribution margin (Urea)[7]

Particulars	Rs per tonne	percent
1. Commission to wholesaler/ retailer	25.69	22
2. Transport charges @ 36 paise per km for 25 kms.	9.00	8
3. Loading/unloading @ 1.06 per tonne for 5 operations	5.30	5
4. Godown rent @ Rs 3/- for 3 months	9.00	8
5. Shortage	8.79	8
6. Interest charges @ 14 percent for 3 months	57.22	49
	115.00	100

7. Sodhi, A.J.S; Reaching fertilisers to farmers' door-steps, paper presented in the Fertiliser Association of India seminar, December 1979. New Delhi . p. IV-1/16.

The above break up was related to a consumer price of Rs.1750/- per MT. of Urea and a dealer price of Rs.1635/- per MT. If the present price of Rs- 2350/- per MT at consumer level and Rs.2210/- at dealer level (with effect from 11-7-1981) is reckoned, the interest calculations shown above will undergo a corresponding change. Likewise the interests charge will undergo a change on account of the change in the bank rate in the intervening period. Whereas the break up given above recognised interest rate at 14 percent the current interest rate is 19.5 percent.

However, the break up shows that the margin seeks to compensate the following distribution functions.

- Retransport
- Handling
- Warehousing
- Interest on carrying the inventory
- Shortage on carrying the inventory.

In addition, it provides for the commission to wholesaler/ retailer. And that is paid to cover the cost of certain other functions. Though these functions are not mentioned explicitly in the break up, it can be assumed that the following functions are covered by this item:

- Risk taking
- Salesmanship
- Sales promotion
- Overheads

A detailed list of the functions expected of distribution channels in the fertiliser business has been presented elsewhere.[8] It can be assumed that the total distribution margin compensates all these functions. The question now is to what extent the channels in the fertiliser business actually perform the various distribution functions?

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8. Please see Chapter II, p.288-291

<u>Many functions are not performed as intended:</u>

The reality, today, is that the fertiliser channels in the country do not satisfactorily perform a number of functions intended to be performed by them. Especially, in respect of the stock holding function, the channel has been continuously shirking its role.

As can be seen from Table - 1 above the distribution margins provide for three months' stock holding by the channel. In addition, the manufacturer gives to the channels two months' credit facility. So, altogether five months stock holding is provided for in the total compensation extended to the channel. No dealer today maintains an average inventory of five months' sales. In fact, the dealers have almost totally shifted to the manufacturers the responsibility for stock holding. This is true, by and large, of the private dealers as well as the co-operatives. If at all some off season stocking is presently taking place, it is due to the fear of inadequate supplies during the peak season or due to the pressure of the state governments on the institutional channels to stock the fertilisers ahead of the manuring season. But conscious and planned off season storage is a rare phenomenon. In any case, it is not certainly in proportion to the provision made for that purpose in the distribution margins.

It may be argued that the channels require credit coverage not only for storing the fertilisers but also to enable them to extend credit in turn to the retailers and farmers. In practice, this argument does not hold good. As far as the cooperatives are concerned, they have the institutional credit which they merely distribute. No link in the cooperative structure is expected to bear the cost of the onward credit out of its pocket. As regards the private trade, they usually collect separately the cost of credit from the farmers, if at all they extend credit facilities to them. As such, in either case, the distribution margins need not contain any provision towards the cost of onward credit. It is enough if it takes care of the cost of holding the stocks - the rolling stock as well as the off season stock. And the provision under this head, as was seen already covers an inventory level of five months' sales. The question now is whether the channels are using this provision for discharging this function or not. If they are not using it for the intended function, they do not deserve to be paid this amount as part of margin.

Cost of stock holding could be delinked from distribution margins:

It can of course be argued conversely, that it is due to the inadequacy of the margins that the channels are unable to perform some of the intended functions. Two alternatives, therefore, can be thought of. (i) The channels could be given a higher level of margins and be enabled to discharge in an ideal manner, all the intended functions of distribution; and (ii) a conscious view could be taken that it is not feasible for the channels to take up, in an ideal manner, certain functions like stock holding and that these functions are better carried out by the manufacturers. Accordingly, a reduced level of margins can be paid to the channel. If at all, the channels come forward to perform the reserved functions, in full measure or in part, the manufacturers may share with the channel the built in compensation in respect of such functions, in proportion to the actual extent to which the functions are performed by the channel. A close examination indicates that, in the given context, the balance of advantages lies with the second alternative - a lower level of channel margins, taking certain expensive functions, like stock holding, outside the domain of the channel.

Fertiliser is a business where the main and the most expensive element in the distribution function is stock holding, especially off-season stock holding. Cost of offseason storage is higher than even the total distribution margin that is presently passed on to the channel. If full neutralisation of the cost of off season storage has to be extended to the channel in the form of enlarged distribution margin, the margin may have to be doubled from the current level. And yet, there is no way of ensuring that the intended offseason storage is carried out by the channel. On the other hand, the manufacturers, whether they like it or not, have to assume the responsibility for offseason storage. They have to, in any case, hold them in stock until they are sold off. It will be, therefore, appropriate to retain the function of offseason storage with the manufacturers and to enable them to claim the corresponding compensation that is built in to the margin structure.

By delinking the stock holding responsibility from the channel it will be possible to cont[illegible] a large extent, the clamour for an increase in the distribution margins, every time an increase in the prices of fertilisers takes place. Stock holding cost being the one component of the distribution cost that varies in proportion to the prices of fertilisers, there will be a case for increasing the channel margins with every increase in prices only if the channel performs the stock holding function in the intended manner. When this function is delinked from the distribution margins the demand for an automatic increase in the margins with every increase in fertiliser prices will become unsustainable. In fact, there is a strong case for increasing the manufacturers compensation on this account every time a price increase takes place for, it is the manufacturer who has to bear the brunt of stock holding. If at all the channels come forward to discharge this burden the manufacturer can pass on the due compensation on this account to the channels.

Margins have become more

attractive with the improvement in delivery terms:

The recent policy of delivering fertilisers freight paid up to block head quarters level has also an indirect effect on dealer margins. The new terms of delivery in effect amounts to an improvement in dealer margins. So far, a part of the dealer margins was getting eroded towards the cost of secondary transport from the railheads or ex-manufacturers' warehouses which are also usually located at the railhead towns. With the new policy, the same margin will be available to the channel, with an added advantage in the matter of delivery terms. In reality, it means an enhancement in margins, the delivery terms being the same as before.

Even though, the government is viewing the new policy as a modification calling for adjustments in cost of transport and not in dealer margins, in effect, the new delivery terms confer added margins to the dealers. It also shifts some burden from the channel to the manufacturer. Any study on channel margins must take due note of the new development of improved product delivery to the advantage of the channel. The demand for increased margins to the channel had been partly based on the hard ship and expenditure incurred by the channel in taking the fertilisers to the block level places. Now that the delivery upto the block level is taken care of without pinching the pockets of the channel the demand for increased margins on this score is no longer sustainable.

Freedom for manufacturers to pay margins according to functions performed by the channel:

Advocating function related distribution margin, S. Venkitaramanan suggests that the provision for stock holding and secondary transport could be built into the price structure but be retained by the manufacturer and passed on to the channel links depending on the extent to which the intended functions are actually performed by them. He says,

> "While the margin concept visualises stock holding to the extent of four months on an average by the distribution network, actual inventory holding by the dealer network - cooperative or private - is much less. In practice, we find manufacturers - not the dealers - holding stocks for longer periods. This is because of the failure of the dealer network to hold stocks. We find the dealers lifting stocks primarily during the season. They expect the inventory to be held by the manufacturers (Exceptions to this are in the case of certain manufacturers' arrangements whereby cooperatives and bulk marketeers are committed to lift certain quantities each month and are invoiced for the same automatically). One can argue that the shortage of credit and rigidity of margin inspite of increase of prices and interest rates are perhaps, the cause of the decline in inventory holding by dealers. However, the FICC on its part, limits its allowance for inventory holding by manufacturers to 3/4th months sales only. As a result, the cost of inventory holding is transferred to the manufacturer from the dealer with no prospect of compensation. In any reconstruction of the margin, there should be a total view of inventory holding. The total length of time for which inventory should be held as between the manufacturer and the dealer should be considered. The costs determined on this basis should be allowed in the price and the manufacturer should be able to share it with the dealer network

- fully or in part, depending on the functions performed, the season etc."[9]

Venkitaramanan also under lines the fact that distribution margins are but one component of overall marketing costs and accordingly, the margins have to be viewed in the context of overall marketing costs and overall marketing functions and on the basis of who performs which of these functions. To quote him again,

> "The distribution margin, normative as it is, for both nitrogenous fertilisers and phosphatics, is only one aspect of the total cost of marketing. It would be in appropriate to emphasise the question of adequacy or otherwise of the margin allowed to the dealer network, ignoring the package of services including credit offered by the manufacturer. An integrated approach to the whole question would involve a general provision for these expenditures in the price. It should be left to the discretion and business judgement of manufacturers to pass it on fully or partly to the various elements of the network. There is a strong case, here as elsewhere, for flexibility in the system to match specific margins to the services performed. This is particularly so when we consider that during the offseason, the manufacturers have to offer various kinds of rebates to these agencies. Similarly, there are various other services which are part of the relationship between trade and industry. When we consider the total margin provided, we should include an allowance for these elements also".[10]

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9. Venkitaramanan. S, <u>Distribution margin</u> paper presented at the seminar held by The Fertiliser Association of India, December 1980, New Delhi. pp. IV - 2/7-10.

10. <u>Ibid</u>.

F.J. Heredia advocates a structure of dealer margins that is partially function related. As per this structure, the dealers will not be automatically entitled for the full dealer margin. Instead, the dealers will get a minimum discount which will be notified by the government and the rest of the margin will be payable to them by the manufacturers in a function related manner. To quote him,

> "This would require revision of the current policy, in that statutory notifications of the 'maximum prices' chargeable to dealers of various categories will have to be substituted by notifications of the 'minimum discounts' that manufacturers will have to grant to dealers. The quantum of 'minimum discount' in respect of each fertiliser product should not be less, and could be more than, the amount provided as 'commission to wholesaler/retailer' (or 'net profit') in the current 'distribution margin'. In the case of urea, for instance, provision of Rs.25.69 for 'commission to wholesaler/retailer' might well be raised to Rs.30/. The dealer's 'net profit' having thus been protected, it should be permitted to the manufacturer to offer dealers 'offseason discounts' as well, by way of inducement to buy and stock goods in advance of the 'busy' season. The advantages to the national economy of inducing dealers to build up stocks at interior villages in this manner must be evident to government. By fixing such discounts at somewhat lower amounts than the manufacturer's own costs of storage, the latter stands to gain some benefit, too. And dealers (cooperatives, for example) who can raise the requisite funds at lower interests rates than the manufacturer pays, and who have spare storage space (even if not more than ten square meters) could conceivably be interested in earning 'offseason discounts', if these are made reasonably attractive, as an addition to the 'minimum discount'"[11]

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11. Heredia F.J. Evolution of a fertiliser marketing system in India - A critical review, paper presented at the seminar held by the Fertiliser Association of India, New Delhi. 1980; pp I-I/20 & 21.

It can be inferred from the above that Heredia, in effect, is advocating 'seasonally differentiated margins' by which the dealers will get a margin that varies in a wide spectrum from month to month over the twelve months of the year. Heredia argues that the government should not interfere with the distribution margins paid by the manufacturers to the channel. The manufacturer must be free to adjust the margin month to month, after guaranteeing the minimum margin, throughout. This will enable the manufacturers to judiciously use the available amount. The dealers also should have no grouse since, they are assured of the minimum margin even on their peak season sales - when the dealers merely exchange the documents and stocks pass on almost directly from the principals to the customers. The amount of minimum dealer margin suggested by Heredia (Rs.30/- MT. for urea) will ofcourse be insufficient in today's context. But the concept can be considered, for it has prima facie merit.

Earlier, J.S. Nirody also had advocated 'seasonally adjusted margins, in order to promote an even flow of fertilisers and to reduce the overall costs involved in fertiliser marketing. Since the nature of fertiliser demand is seasonal, the stocking period varies dependant on the month of purchase. Accordingly the interest component in the distribution cost also varies. According to Nirody, in a margin structure that is uniform through out the year, there is no incentive for the channel for stocking in the offseason months. The attempt on the part of the channel to go in for the purchases only during the season, affects the even flow of the fertilisers from the production units to the channel. A system of seasonally differentiated margins will assist in achieving even flow of the fertilisers.

Nirody, however, admits that there are a number of practical difficulties in implementing seasonally differentiated margins in a country like India. He specifically mentions the following difficulties:-

" 1. An all-India scheme cannot be evolved due to variation in peak and offseason in different parts of the country.

2. Even within a State (particularly in the larger States) season could vary in different parts due to agro-climatic variations and / or cropping pattern.

3. A manufacturer operating in a number of States will have to evolve and operate varying systems in his various markets.

4. To make the scheme acceptable to both parties, it will be necessary to ensure that the total cost to the supplier, i.e. the margin and other facilities enjoyed by the distributor, remain the same as in the case of uniform terms throughout the year. Otherwise, the scheme will not be accepted by the party that stands to lose.

5. The most difficult problem would arise in identifying the lean and peak months, estimating the monthwise pattern of sales and the required (or desired) period of stocking for each month.[12]

Taking into account such difficulties and based on certain assumptions on consumption pattern, sales pattern by the channel, rate of interest, etc., Nirody divides the entire year into six time intervals of two months each and suggests a sliding scale of

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12. Nirody, J.S.; "Staggering of distribution margin to promote even flow of fertilisers" in Fertiliser News, December 1979, The Fertiliser Association of India, New Delhi. pp. 3-6.

dealer margins for Urea ranging from Rs.97/- to Rs.151/- per tonne. He adjusts the margin from one time interval to the other, provided there is seasonal variation between them, by Rs.18/- which is the cost of credit per tonne per month.

The substance of the foregoing arguments can not be ignored. Distribution margins is a very important component of fertiliser marketing costs. If the margins are not contained, it would be difficult to contain the marketing costs in the fertiliser business. If the existing practice of giving away the notified margins in full measure irrespective of whether the channel performed the intended functions or not is continued and a justification in addition is also found for enhancing the margins from the existing levels, then the inflationary pressure on fertiliser marketing costs may get an additional lease of life. It would be unwise to jack up the margins still further without ensuring the due performance of the intended functions by the channels. What is required on the other hand is a proper evaluation of the distribution functions performed by each type of channel members and disbursement of margins to each of them in relation to the functions performed by them.

Since it seems difficult to ensure the stock holding function on the part of the channel, it would be advisable to keep the margin at a low level and to compensate the manufacturer for the stock holding responsibility, with the option of passing it on to the channel if the manufacturer is satisfied about the performance of the channel in that respect. Under this approach, the case is for a downward revision of the distribution margins and not for an upward revision.

CHAPTER - 13.

MARKETING COSTS

Marketing costs constitute a very significant part of the total costs in the fertiliser business. Yet, so far, this cost area has not been studied in depth.

In 1968, F.W. Parker of United states Agency for International Development (USAID) presented a paper on this subject at a seminar held by the Fertiliser Association of India.[1] In his paper Parker listed the functions of fertiliser marketing and presented data on the costs of these marketing functions in the United States, Europe and some developing countries. He also commented on the applicability of those observations to India. But this analysis is out dated now and of little relevance in today's context.

In 1977, F.J. Heredia, in an article published in Chemical Age of India. analysed the distribution costs in the Indian fertiliser business.[2] This study covered only a segment of the marketing costs and not the marketing costs in full.

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1. Parker, F.W; The functions and costs of fertiliser marketing services, paper presented at the seminar held by the Fertiliser Association of India, New Delhi, 1968.

2. Heredia, F.J; "Availability of fertilisers can't it be extended and made more reliable without increasing costs" Chemical Age of India, 27th Anniversary issue, 1977, Bombay, pp.153-160

In 1982, H.J. Mittendorf published a paper on "Marketing costs and margins for fertilisers in developing countries."[3] This paper also did not attempt to give a comprehensive idea of the marketing costs in the fertiliser business of India. The study was undertaken in an experimental manner to be followed up by a number of detailed studies on the subject in the future. Secondly, the data presented was only sketchy as the position obtaining in a large number of countries in the two continents of Asia and Africa had been compressed into a brief paper. Thirdly, this paper too dealt with only one fertiliser product viz. urea.

The total absence of previously developed data on marketing costs necessitated original efforts for generating the required data. The decision to carry out a survey of the fertiliser industry of India, as a part of this research, was a consequence of the absence of previously developed data on the subject.[4]

Elements of marketing costs
<u>in the fertiliser business:</u>

It is evident that effective fertiliser marketing rests on the successful performance of a large number of marketing and distribution functions. Most of the cost elements involved in fertiliser marketing are directly related to these functions. As the functions involved in the job could be grouped under a few homogeneous categories, the costs involved in the job could also be grouped under a few broad categories.

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3. Mittendorf H.J; "Marketing costs and margins for fertilisers in developing countries," <u>Fertiliser News, November 1982</u>. The Fertiliser Association of India, New Delhi. p.23

4. Please see Chapter - 2, page.9.

And the grouping can be done in a number of ways. A three factor grouping of costs is followed by some firms. These firms group the marketing cost elements under the categories of

— Distribution costs

— Promotion costs

— Administration costs (overheads)

Since cost of credit, i.e., the cost of interest on the stocks held and the accounts receivables on credit supplies of the fertilisers is an important component of the marketing costs in the fertiliser business, some fertiliser firms include cost of credit as a separate category. It is named differently by different firms. Some refer to it as interest cost, some as cost of finance some as cost of working capital and some others as inventory carrying cost.

The consultant appointed by the Ministry of Chemicals and Fertilisers of the government of India, preferred a four factor grouping as shown below.[5]

— Distribution margins

— Selling cost

— Promotion cost

— Over heads.

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5. The Fertiliser industry coordination committee (FICC) of the Ministry of Chemicals and Fertilisers of the Government of India retained the Fertiliser Planning Development of India Ltd.,(FPDIL) in 1981 to study the fertiliser marketing costs. FPDIL, in their questionnaire to the fertiliser industry used the four factor grouping of the marketing costs.

No doubt, there are many advantages in grouping the large number of cost elements into a few broad categories. At the same time, there are certain difficulties too in such categorisation. Some important cost elements might be left out of the categories, because it may be inappropriate to put them in any of the listed categories. Also, due to the variations in the perceptions of the different firms and the variations in their accounting procedures a given category of costs may mean different things to different firms. If the cost elements are listed out exhaustively and the costs are reckoned against each individual cost element instead of against groups of cost elements, the costs incurred by each and every function will come into focus. But the process of gathering and analysing data will become cumbersome if each cost element is considered separately. In order to avoid the difficulties of both the methods and to retain the main advantages of both, the following procedure was used for collecting marketing cost data through the census survey of the industry

In the first place the individual cost elements which the research study sought to analyse were listed out exhaustively without any grouping whatsoever. The elements listed were as follows:-

(i) Primary transport

(ii) Road bridging at the rail terminal if primary movement takes place by rail(by unit trains)

(iii) Secondary transport

(iv) Handling; loading and unloading at two or more levels, as applicable.

(v) Tertiary transport if applicable

(vi) Interwarehouse transport of stocks

(vii) Rebates allowed to the channel towards transport

(viii) Distribution margins

(ix) Special discounts, rebates and commissions paid for consummating the sales

(x) The cash equivalent of the credit extended to the channel.

(xi) Advertising

(xii) Sales promotion

(xiii) Publicity

(xiv) Public relations

(xv) Technical services

(xvi) Farm services

(xvii) Extension work of various types

(xviii) Warehouse rent

(xix) Warehouse administration expenditure

(xx) Cost of interest on the finished products

(xxi) Cost of losses in storage including the cost of repacking etc.

(xxii) Salaries and wages of marketing staff

(xxiii) P.F. Welfare expenditure etc.

(xxiv) Travelling expenses

(xxv) Over heads and all other costs not covered by any of the items listed above.

After listing out the cost elements individually as mentioned above, for the sake of convenience in computation, analysis and comparison of the costs, the above listed cost elements were grouped into five groups as shown below:

(1) Transport cost

(2) Distribution margins

(3) Promotion cost

(4) Inventory carrying cost

(5) Other costs of marketing.

Cost elements (i) to (vii) were grouped under (1) Transport and handling cost. Elements (viii) to (x) were grouped under (2) Distribution margins. Elements (xi) to (xvii) were placed under (3) Promotion cost. lements (xviii) to(xxi) under (4) Inventory carrying cost and (xxii) to(xxv) under (5) Other costs of marketing.

A detailed explanation of the itmes of costs under each category was made available to all the respondents in the survey.

The behaviour of marketing costs
<u>in the fertiliser business:</u>

The survey of the fertiliser industry carried out as a part of this research has revealed that the marketing costs in the fertiliser business forms a very significant part of the farm-gate prices of fertilisers. On an industry average, it forms approximately 18 percent of the farm-gate prices of fertilisers, if packaging cost is also considered as an element of marketing costs. If packaging cost is excluded, it forms roughly 14 percent of the farm-gate prices.[6]

<u>Marketing costs in 1980-81:</u>

The marketing costs incurred during 1980-81 by nine fertiliser firms from whom data was received on a comparable basis through the survey are shown in Table-1.below. The marketing costs have been grouped under five heads:

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6. Please see page 335 below.

T A B L E - I

MARKETING COSTS OF NINE MAJOR FERTILISER FIRMS - 1980-'81

(Rupees per tonne)

	G.S.F.C.	R.C.F.	S.F.C.	M.F.L.	M.C.F.	I.E.L.	F.A.C.T.	S.P.I.C.	I.F.F.C.O.
Transport Cost	90	95	120	87	136	81	163	198	178
Distribution margins	100	108	108	150	115	113	112	125	161
Promotion cost	7	7	7	8	2	2	-	7	5
Inventory carrying cost	11	-	22	19	-	48	51	74	69
Other marketing costs	37	48	15	29	44	86	58	35	130
Marketing cost per M.T.	245	258	272	293	297	330	384	439	543
Marketing cost as a percentage to sales turn over (farm-gate prices.)	9.2	10.8	11.6	11.3	12.7	14.0	14.8	16.6	18.8

Source: Date collected through the survey of the industry.

Note: 1. In the case of R.C.F. the details relate to 1979-80.

2. In the case of R.C.F. and M.C.F. 'inventory carrying costs' are included in 'other marketing costs.' In the case of some other firms too, inventory carrying costs are partly included in other marketing costs.

3. In the case of F.A.C.T. the promotion cost is included in other marketing costs.

4. In the case of I.F.F.C.O. the distribution margin includes cash rebates to the tune of Rs.34/- per M.T. given in lieu of credit. In other words a part of the cost of credit is included in the distribution margins otherwise, distribution margins work out to Rs. 127/- M.T.

5. In the case of S.P.I.C., the cost figures are the averages for the fertilisers produced and marketed by them and those bought from the pool (imports) and marketed by them. Separate cost data is not readily available.

TABLE - 2

Weighted average marketing costs of firms under retention price system - 1980 - 81

	Cost element		Rupees per tonne
(1)	Transport cost	-	134.50
(2)	Distribution margins	-	128.30
(3)	Inventory carrying cost	-	38.42
(4)	Other marketing costs (other than 1, 2 and 3 above)		67.18
	Total marketing costs		368.40

Note: Weighted averages have been worked out, reckoning the quantities marketed by each firm. The quantities have been shown on page 394.

Weighted average value of the fertilisers (farm gate prices) — Rs 2600 per tonne

Percentage of marketing costs to farm gate prices — 14 % (excluding cost of packaging)

18 % (including cost of packaging)

Packaging cost = Rs 105 per tonne.

(1) Transport cost (2) Distribution margins (3) Promotion Cost (4) Inventory carrying cost (5) Other marketing costs. All the cost figures in the Table are amounts spent for marketing a unit quantity of fertiliser (one M.T.). In the case of multiproduct firms, the cost figures shown in the Table are the average cost per unit quantity of all the products combined.

The weighted average of the marketing costs incurred by the nine firms in 1980-81 works out to 368.40 per M.T. It is reasonable to take this figure as the average for the industry as a whole in respect of the products covered by the retention pricing system. In this category, a total quantity of 6.35 million M.T. of fertilisers was marketed in 1980-81.[7] Accordingly, the marketing costs incurred by this category of fertilisers during 1980-81 works out to Rs.234 crores.

As regards imported fertilisers, a total quantity of 4.6 million M.T. was marketed in 1980-81.[8] The marketing costs in respect of imported fertilisers are usually higher than the marketing costs in respect of the fertilisers covered by the retention price system. It was mentioned earlier that the transport cost in respect of imported fertilisers has to be reckoned at Rs.180/- per tonne.[9]

As regards inventory carrying cost, an amount of Rs.199 - per tonne may have to be reckoned.[10] As regards distribution margins, Rs.121/- may have to be reckoned.[11] Accordingly the marketing costs in respect of imported fertilisers has to be reckoned at Rs.568 per tonne, assuming that except in these three major elements of costs there is no significant variation between imported fertilisers and the domestic fertilisers under retention pricing system. Accordingly the

7. Chapter - 9, p.221
8. Ibid
9. Ibid
10. Please see Appendix XXXII p. 412
11. Ibid

total marketing costs in respect of the fertilisers in this category will therefore work out to Rs.261 crores.

As regards the domestic fertilisers which are outside the retention price system, a total quantity of 1.89 million M.T. was marketed in 1980-81.[12] The marketing costs incurred by this category of fertilisers are usually lesser than those incurred by the fertilisers covered by the retention price system. On an estimated marketing cost of Rs.246 per tonne in respect of this category of fertilisers, the total marketing cost incurred by this category works out to Rs.46.5 crores.

Thus the grand total of marketing costs incurred by all the categories of fertilisers during 1980-81 works out to Rs.541.5 crores This excludes the packaging costs.

Marketing costs in 1982-83

While examining the fertiliser transport costs, it was mentioned that the actual costs of transport for the year 1982-83 had not been collected through the survey. It was also mentioned that in order to appreciate the latest position in this regard it was essential to have an estimate of the cost of transport during 1982-83.[13] This holds good in respect of marketing costs as well.

The total transport costs in the fertiliser business during 1982-83 had been estimated at Rs.251.5 crores.[14] The total inventory carrying

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12. Chapter-9, p. 221

13. Ibid. pp. 222 - 223

14. Ibid., 224

costs during 1982-83 was estimated at Rs.257.4 crores.[15] The total distribution margins incurred in 1982-83 was estimated at Rs. 188 crores.[16] These are the three major components of fertiliser marketing costs. And it is in these three elements that substantial increase had occurred during 1982-83 as compared with 1980-81. As regards the other elements of marketing costs, it can be assumed that the 1980-81 level holds good for 1982-83. On the basis of such an assumption, a total of Rs.100.4 crores has to be reckoned for 1982-83, under this head. Thus the grand total of fertiliser marketing costs in 1982-83 could be placed at Rs.797 crores. This excludes the packaging costs.

Noteworthy features of the behaviour of marketing costs.

Detailed analysis of the behaviour of fertiliser marketing costs reveals the following facts.

(i) The marketing costs in the fertiliser business are quite sizeable.

(ii) The costs show an uptrend

(iii) The high level of fertiliser marketing costs and the uptrend in the costs are not fully justified by the nature of fertiliser marketing functions.

(iv) Transport cost, distribution margins and inventory carrying cost are the three most significant elements of the fertiliser marketing costs.

(v) There are wide interfirm variations in the fertiliser marketing costs.

It is worthwhile to describe these features in detail.

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15. Chapter - 10; p. 268

16. See Appendix XXIX p. 409.

(i) <u>The marketing costs are sizeable</u>

It is evident that the marketing costs in the fertiliser business are quite sizeable. It is in the order of Rs.700 crores per annum. The total sales turnover in many large businesses in the country is lesser than this amount. As a percentage to sales turnover too, the marketing costs in the fertiliser business are quite significant. The marketing costs form 18 percent of the sales turnover, if packaging costs are included and 14 percent of the sales turnover, if packaging costs are excluded. In the case of many consumer goods too the marketing costs may form 15 to 20 percent of the sales turnover. It may therefore appear that the marketing costs in the fertiliser business are quite reasonable. But fertiliser is a high volume and high cost (unit cost) product, unlike most consumer softs which are relatively low volume, and low cost (unit cost) products. Moreover fertiliser is an essential commodity. A relatively low cost distribution system is an imperative as far as this commodity is concerned. Viewed against that reality, the marketing costs incurred by the fertiliser business appears to be quite high.

(ii) <u>The marketing costs show an uptrend</u>:

The fertiliser marketing costs in 1982-83 went up to Rs.797 crores from Rs.541.5 crores in 1980-81. The uptrend in the marketing costs is not readily explained by the increase in the volume of fertilisers marketed, For the cost increase has been more than proportionate to the volume increase. In other words, the marketing costs per unit of fertiliser sold has gone up. The cost per unit quantity (one tonne) in 1980-81 was Rs.422/- in 1980-81. It went up to Rs.533

in 1982-83. Considering the entire fertiliser business in the country, the marketing costs formed 18 percent of the total sales turnover of the business in 1980-81. It went up to 19.5 percent of the turnover in 1982-83.

Cost of transport alone went up from Rs186.5 crores in 1980-81 to Rs251.6 crores in 1981-82. Cost of transport per tonne went up from Rs.145/- in 1980-81 to Rs.168/- in 1981-82. And dealer margins went up from Rs.110/- per tonne to Rs.135/- per tonne.

(iii) The marketing costs are not fully justified <u>by the functions of marketing:</u>

Prima facie it may seem that the high level of marketing cost in the fertiliser business are justified by the nature of the functions involved in fertiliser marketing. Detailed analysis however shows that the high level of marketing costs cannot be attributed in toto to the nature of the fertiliser business and the functions that have to be performed for successfully carrying out the marketing task. Even if the marketing costs of 1980-81 is taken as justified by the nature of the fertiliser marketing functions, the uptrend in the costs between 1980-81 and 1982-83 cannot be justified by the same token. Nor is it correct to attribute the uptrend to the general hike in costs due to the overall inflation in the economy. On the contrary, it appears that a substantial part of the increase in the marketing costs is due to reasons that are internal to the business.

For example, fertiliser transport cost is high not merely because the freight rates in rail and road transport systems are high and are going higher, but also because the fertiliser business incurs a good deal of avoidable expenditure on transport due to competition, which cannot be justified by objective criteria. This aspect has been dealt with in detail earlier.[17]

Similarly, the high cost of inventory carrying is not fully justified by objective criteria. It is admitted that the high level of inventory carrying cost is contributed in large measure by factors like the seasonal nature of fertiliser use, the high prices of fertilisers and the high rates of interest ruling at present. Yet, by proper coordination between the pool and the domestic fertiliser industry, the overall fertiliser inventory in the country could have been kept down. If this had been done then it was merely a question of reckoning which agency was required to hold how much of the total inventory as a part of the overall policy and how much of compensation on this account should go to the respective agencies. Thereby, the total inventory carrying costs incurred by the country could have been contained at a lower level. Moreover, through better inventory policies and better inventory control techniques both the pool and the domestic industry could have reduced their respective inventory carrying costs. This aspect was dealt with in detail in the chapter on fertiliser warehousing.[18]

As regards distribution margins too, it appears that efforts could have been made to contain them. When there was clamour for an increase in the distribution margins on the ground that the in crease in the prices of fertilisers warranted an upward revision of the margins, the government yielded to the pressures and allowed an adhoc increase in the margins. But the government did not have any

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17. Please see Chapter - 9.pp.225 and 243-245

18. Please see Chapter - 10.pp. 246-260.

instrument to ensure that the channels performed the intended distribution functions. The experience of 1981-82 and 1982-83 has been that the fertiliser business is unable to get the distribution job done by the channel in the intended manner. The business incurs double expenditure on some of the distribution functions. For example, the cost of offseason inventory holding is, to an extent built into the distribution margins. But since the distribution channels do not perform this function to the extent intended, the inventory holding expenditure is incurred twice by the business - by way of interest on inventory actually held, as well as by way of distribution margins. Similar is the case with secondary transport cost. This aspect has been dealt with in detail in the Chapter on 'Distribution margins'.[19]

In fact, most of the marketing executives in the fertiliser industry interviewed by the researcher conceded that atleast a part of the uptrend in fertiliser marketing costs could have been avoided. They explained that in the first place, the glut conditions in the business could have been averted by freezing the pool stocks for the present and limiting the role of the pool to one of residual supplier, in letter and spirit. This would have, in their opinion, helped the domestic fertiliser firms to offlead their stocks at considerably lesser marketing costs. The pool has been playing a competitive role, instead of a residual role. Under conditions of surplus availability of fertilisers, the competitive role of the pool has added to the strain of

19. Please see Chapter - 12, pp. 312 - 318.

marketing and pushed up the marketing costs. Secondly in their opinion, the liberal margins and terms offered by the pool to the pool handling agencies contributed in a substantial measure to the overall increase in the costs of marketing. They felt that under the existing conditions, they had no alternative but to make their own terms of sale more and more attractive, increasing the marketing costs in the bargain.

A third aspect that was highlighted in thisrespect by the marketing executives was the regulation of margins and terms of trade by the government. They felt that by taking away the freedom of the manufacturers in this matter, the government had pushed up the marketing costs. The industry had to part with the notified margins to the distribution channels even if the latter failed to perform some of the distribution functions as intended. This practice pushed up the marketing costs. They also felt that the differential margins and differential terms of credit made applicable to the institutional channels and the private trade also contributed to the overall increase in the marketing costs in the business.

The variations between the terms of sale applied to the pool stocks and those applied to the domestic stocks as well as the variations between the terms of sale applied to the institutional channels and those applied to the private trade have created certain unhealthy marketing practices resulting in additional marketing costs to the entire fertiliser business. The situation paper developed by the Fertiliser Association of India in December 1982 made the following comments on this subject.

> "The continuing excess availability of fertiliser in the market had created the glut situation with the resultant phenomenon of severe cash credit problems. The situation was aggravated by varying terms and conditions permissible to different distribution channels. This triggered unrealistic discounts, credit terms, margin and other practices. The industry could ill afford to offer these terms and has, therefore, been suffering from the effects of these practices. Health of the Industry is being eroded. Healthy competition is always welcome but unhealthy practices must be eliminated." [20]

It will be evident from the various points mentioned above that atleast a part of the uptrend in fertiliser marketing costs could have been avoided if the industry and the government especially the latter, had followed certain other policies in the matter of fertiliser marketing.

It appears at the same time, that in another manner too the marketing costs could have been contained. For, some firms have managed to keep the marketing costs under reasonable check despite the hurdles created by the overall policies operating in the business. This was achieved through greater efficiency in marketing. This aspect will be discussed below.[21]

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20. Fertiliser News, December, 1982, op.cit; p.112

21. Please see pp.347-353 below.

(iv) The three most important elements
in fertiliser marketing costs:

The study has revealed that transport cost, dealer margins and inventory carrying costs are the three most significant components of fertiliser marketing costs in India. These three components together account for 85 percent of the total marketing costs in the business. Evidently, other items of marketing costs are not quite significant in the marketing and distribution of fertilisers.

It is in this context that attention in this study was focussed on Transport, Warehousing and Distribution channels of the business. In each of these areas, an attempt has been made to examine how the costs behave and whether there is scope for reduction in the costs. Chapters 9, 10, 11 and 12 are devoted to this investigation.

(v) Wide interfirm variations
in marketing costs:

Table-1 above shows that there are wide variations in marketing costs from firm to firm in the fertiliser business.

During the process of data collection from the various fertiliser firms it was found that there are variations in the understanding of the different firms as to the elements that constitute the marketing costs. While gathering the data, it had to be ensured that all the reporting firms had the same understanding of the term 'marketing costs' and the elements considered under it. The interfirm variations that are high lighted here are the ones that have come to the fore after analysing the data on a comparable basis.

It can be seen from Table-1, that the marketing cost per unit quantity varies from Rs.245/- in the case of GSFC to Rs.543/- in the case of IFFCO. There are two distinct groups among the nine firms under camparison. Six firms viz., GSFC, RCF, SFC, MFL, MCF and IEL have relatively lower marketing costs. Their marketing costs range from Rs.245/- to Rs.330/- per unit quantity. Three firms viz. IFFCO, SPIC, and FACT have relatively higher marketing costs. They range from Rs. 384/- in the case of FACT to Rs.543/- in the case of IFFCO.

It can also be seen that the interfirm variations in marketing costs are equally wide when the costs are expressed as a percentage to total sales revenue of the respective firms. In the case of GSFC, the marketing costs expressed as a percentage of their total sales revenue works out to 9.2 percent. In the case of IFFCO, it is 18.8 ~~xx~~ percent. The marketing costs of four out of the nine firms have been 14 percent or above of their respective sales revenue.

The inter firm variations are equally pronounced even when each individual item of marketing costs is considered separately. For example, considering transport and handling costs, four firms have managed within Rs.81/- to Rs.95/- per M.T. Three firms have incurred more than Rs.160/- per M.T. Taking distribution margins, the expenditure varies from Rs.100/- per M.T. in the case of GSFC to Rs.161/- per M.T. in the case of IFFCO. When we consider 'other marketing costs' which is synonymous with 'marketing overheads,' IFFCO, again tops the list with Rs.130/- per M.T. whereas Sriram Fertilisers has incurred only Rs. 15/- per M.T.

Reasons for interfirm variations
<u>in marketing costs:</u>

There are many reasons for the wide variations in marketing costs between one firm and another in the fertilisers business.

In the first place, there are significant variations in the marketing and distribution functions performed by the different firms. Also the same function is performed to varying levels of perfection by the different firms. Such variations in functions and the manner of carrying out the functions arise in turn due to the differences in the marketing objectives chosen by the firms and the marketing patterns adopted by them. These variations explain a part of the difference in the marketing costs of the different firms. Another part of the interfirm variations in marketing costs is explained by the inherent marketing advantages enjoyed by some firms and the inherent marketing disadvantages suffered by some others, in terms of location, product mix, etc. A further reason for the interfirm cost variations is the difference in the marketing efficiency between one firm and another

The interviews with the marketing executives of the various fertiliser firms conducted by the researcher as a part of the field survey helped to clarify the factors influencing the marketing costs in the fertiliser business. It also provided the basic clues to the variations in the marketing costs between one firm and the other.

The respondents cited the following factors as contributors to marketing costs:-

- Extent of marketing territory
- Intensity of market coverage
- The marketing system/model adopted by the firm
- Location
- Product mix
- Functions performed and services provided by the firm to the channel and customers.
- Government regulations on transport, terms of trading, terms of delivery, etc.
- Degree of efficiency in the marketing operations.

In as much as there are substantial variations from firm to firm in the foregoing factors, the marketing costs too show wide variations between one firm and another.

The need for reducing
the marketing costs:

It is highly essential that the marketing costs in the fertiliser business are contained at a reasonable level. While such a requirement may be applicable to any business and not to the fertiliser business alone, it appears that reduction of marketing costs is of particular importance to the fertiliser business of India at the present juncture. The industry and the government can-not escape this requirement. The alternatives to cost reduction are an increase in the delivered prices of fertilisers to the farmers and a consequent increase in the prices of food grains to the common man or an increase in the subsidies on fertilisers and food and the consequent addition to the drain of funds from the public exchequer.

Neither of the alternatives would be desirable. Also if, there is no systematic and uniform type of effort to reduce marketing costs, the result would be haphazard attempts by the industry to control some/one or other of the elements of marketing costs which might lead to inefficient and defective distribution of this crucial agricultural input.

It is the accepted policy of the Government of India to keep the farm gate prices of fertilisers as low as possible. The present level of prices is by no means low. And it will continue to go up steadily due to the steady increases in the manufacturing costs. As such, there cannot be two opinions on the need for containing the marketing costs and thereby containing the farm gate prices of fertilisers within reasonable limits. To quote Heredia,

> " To raise consumer prices is no way out of this situation, for, demand falls of sharply with price increases, thereby slowing down (even reversing) growth rate of consumption. The only other way is to improve the efficiency of all activities involved in selling the product, from the point of manufacture to the point of sale"[22]

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22. Heredia, F.J; "Systems approach to fertiliser distribution," <u>Fertiliser News July, 1978</u>; <u>op.cit</u>; p.6

While reduction in marketing costs is essential, the quality of marketing service should not be sacrified in the process of cost reduction. If a minimum cost has to be inevitably incurred for performing an essential marketing function or for providing an essential marketing service to the channel or the customer, it should be incurred by all means. Marketing cost reduction should not become a slogan to be implemented without looking into its adverse impact on the quality of marketing services. Parkar lays great emphasis on this requirement when he says:

> "The figures may surprise some members of this seminar. If that is the case it may be due to the fact that a good marketing service is quite different from the dominate system that has been used in India. The Central Pool - State Government - Cooperative system has not performed any of the five marketing functions well. The new agricultural strategy requires an efficient marketing system for fertilisers and other inputs. A poor system will impede agricultural production and development. It would be false economy to sacrifice the quality of marketing services in order to slightly reduce the selling price of the product. Indian farmers need high quality fertilizer marketing services as well as high quality fertilisers." [23]

The question is whether fertiliser marketing costs could be reduced or contained without lowering the quality of marketing service.

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23. Parkar, op.cit; pp.17 & 18

In fact, a few respondents in the survey conducted by the researcher had raised doubts regarding the feasibility of maintaining the quality of marketing service in the emerging conditions without increasing the marketing costs. This doubt was expressed on the implied assumptions that the existing quality of marketing service in the fertiliser business was good and that the existing structure of marketing costs are fully justified. The study reveals that both these assumptions are questionable. The existing quality of marketing service is by no means ideal though it has improved considerably since Parkar made the statement quoted above. The marketing service has to be improved much more if the projected rates of growth in fertiliser consumption have to be achieved.[24] Mere maintenance of the status quo in respect of marketing service and marketing costs will not meet the emerging requirement of fertiliser marketing in the country. On the contrary, the requirement is to improve the marketing service, keeping the marketing costs under check.

It seems possible to achieve simultaneously the twin objectives of containing the marketing costs and improving the marketing service. Efficient and innovative marketing is the main answer. It also requires a perfect identity of interests and perfect coordination of marketing approaches between the government and the indestry. Without meeting the latter requisite, through efficient marketing alone, the twin objectives can not be achieved. This is so because government policies exercise a tremendous impact on fertiliser marketing in India.

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24. Please see chapter-3, page 46.

Government is also a direct partner in the fertiliser marketing system. The marketing of imported fertilisers is entirely in the hands of the government. Reduction of marketing costs has to be a matter of shared concern between the government and the industry.

Once the government as well as the industry become seriously concerned about the marketing costs it may not be very difficult to find ways for reducing or containing the costs. It seems that a 'systems approach' could be applied to great advantage in controlling the fertiliser marketing costs.

The various functions of fertiliser marketing such as transportation, inventory management and channel management interact closely with one another. In the nature of things, these functions require a high degree of coordination. If the functions are considered in isolation, each function may tend to adopt a narrow view of the objectives and requirements of marketing resulting in suboptimisation of the overall efficiency of the marketing task. Further, because of the interrelated nature of the various functions, the various marketing cost elements are also closely interrelated. One element subsidises another. Accordingly, all the elements have to be considered together and controlled. Marketing cost control will get fragmented if the interrelated, interacting and inter dependant cost elements are considered one at a time and in isolation for the purpose of control.

In view of the close interrelationship of the functions as well as the costs thereof, it would be advantageous to fit the decisions on the various functions in a system frame work. Each function of fertiliser marketing has to be viewed as an integral part of a unified system and decisions on each function must be taken in alignment with the decisions on the various other functions of marketing. In other words, a conscious effort should be made to view fertiliser marketing as a single integrated system or a single unified function stretching from factory to farmer. Under such a total system approach, it would be easier to optimise the total efficiency and minimise the total cost of fertiliser marketing.

SUMMARY AND CONCLUSION

The crucial role of fertiliser in India's agriculture:

Agriculture is the main stay of the economy of India. For the past several years, the country has been assigning in all her plans of economic development a high priority to agricultural progress. Yet, the nation has never found it easy to produce the food grains and other farm commodities required for feeding her vast and growing population. Indications are that the problem is bound to remain with the nation for several years to come. It is not that Indian agriculture is in a hopeless position. The farm sector of India does hold great promise, but the fulfilment of the promise remains a distant dream.

From the latter half of 1960's, Indian agriculture has been undergoing a rapid process of modernisation. The green revolution that took place in 1966 was primarily responsible for this. This was not a total revolution. It was confined to a few selected parts of the country. The initial momentum could not also be maintained for long. Yet, the fact remains that the green revolution provided a technological break through in the age old problem of stagnant farm production.

Application of massive doses of chemical fertilisers to the soil has been a major component of the new strategy in agriculture that ushered in the green revolution. In fact, the green revolution of India has been the outcome of the productive interaction of high application of chemical fertilisers, provision of abundant irrigation and the use of new crop varieties capable of responding most favourably to high application of both fertiliser and water.

The level of fertiliser consumption is universally regarded today as an important index of agricultural progress. In the Indian context, fertiliser use assumes an added importance. In India, there is not much scope for increasing the area under cultivation. Nor is there scope for a spectacular increase in the area under assured irrigation. The strategy has got to be one of intensive cultivation - of increasing continuously the productivity per unit of cropped area per unit of time. The land - man ratio in the country is already narrow and with increase in population, would become narrower still in coming years. The growing demand for farm produce could be met only through increasing the productivity level. Evidently, the role of fertilisers in Indian agriculture is especially critical. It will become all the more important in the years to come as agriculture in many other parts of the country gets modernised.

India has committed herself firmly to the strategy of enhancing the agricultural production through increased fertiliser use. Judged from the achievements in farm production registered by the country, the strategy appears to have paid off.

The Fertiliser business is extremely large and complex

The strategy of adopting fertiliser use as the means to achieve a major break through in farm production has given a great fillip to the fertiliser business of India. Production and marketing of fertilisers have become vital functions in the economic system of the country.

Consequent to a policy decision to aim at self sufficiency in fertilisers production the country has laid great emphasis on increasing the domestic production of fertilisers. Fertilisers production in India went up from 39,000 MT in 1951-'52 to 1.24 million MT in 1971-72. It again went up to 4.1 million MT in 1981-82. The investment in fertiliser production in India stood at Rs 5,247 crores as on 1-1.-1981. It is poised to be Rs 7,500 crores by 1984-85. The total installed production capacity of the fertiliser industry in the country stood at 4.7 million MT. of N and 1.5 million MT of P as on 1-10-1981.

The Indian fertiliser industry is quite large even by international standards. India is the fourth largest producer of nitrogenous fertilisers and the eighth largest producer of phosphatic fertilisers in the world. The fertiliser industry of India is not only very vast but also very complex.

The manufacturing units show great variations in the matter of vintage, size, product mix, technology employed, capital employed per unit of production capacity and operational efficiency. In ownership pattern too, the units pose a variety. They are spread over the public sector, the private sector, the cooperative sector and the joint sector.

<u>Fertiliser marketing is unique in many respects.</u>

With an annual sales of more than Rs 5000 crores, fertiliser is already a big business in India,. And it is poised for further Growth, though at the moment, the growth rate is somewhat unsatisfactory due to the combined influence of a number of adverse factors that are short term in character. The Sixth Five Year Plan of the country has envisaged a consumption of 8.4 million MT. of fertiliser nutrients by 1984-85. In terms of fertiliser material, the above consumption estimate will mean 22 million MT. At current prices, exclusive of state subsidies and sales taxes, the value of the fertilisers estimated to be consumed in 1984-85 will work out to more than Rs.4000 crores. In a business of such magnitude, 'marketing' will, evidently be a difficult and demanding task.

Size is not the only attribute that makes the fertiliser marketing job difficult and demanding. The job involves a number of complexities. Two sets of factors give rise to these complexities. Firstly, there are those factors associated with the nature of the product and the consumer. The uniqueness inherent in the product and the consumer makes fertiliser selling a complex and unique job. The strict governmental regulation of the business gives rise to the second set of factors. Practically all important aspects of fertiliser marketing, such as pricing, warehousing, transportation and distribution margins come directly or indirectly under governmental regulation.

An analysis of the genesis and growth of fertiliser marketing in India shows that it has been the first organised and major effort in rural marketing in India. A number of other manufactured goods had penetrated the rural markets of India prior to the entry of fertilisers, but this was sporadic and on a much smaller scale. Fertiliser marketing stands out as the first massive effort in rural marketing, involving a great social innovation, an incessant process of education, an enormous effort at physical distribution, transportation and warehousing and a major experiment in rural mass communication.

Fertiliser marketing in India has been unique in its social content as well. It has never been a purely commercial venture. Basically, it has been a process of taking science and technology to the farming community located even in the most interior parts of rural India. The process did succeed to a large measure in its basic objective of transforming vast masses of farmers from traditionalism to modernity. At the same time the process definitely had its commercial dimensions too. It is to the credit of fertiliser marketing in India that it was able to strike a happy balance between the social and commercial demands of the business.

Yet another striking feature of the fertiliser marketing process has been the high degree of coordination among the different agencies like the government, the industry and the distributor in the public, private, joint or cooperative sectors.

Impact of government policies on fertiliser marketing:

Government policies have always been a major guiding force in the development of the fertiliser marketing system in India. The government has declared fertiliser an essential commodity in view of its crucial importance to the agricultural economy of the country. The government also exercises stringent controls over the production, imports, distribution and pricing of fertilisers. It will not be incorrect to conclude that fertiliser marketing in India has to a large extent been the direct outcome of the policies and programmes of the government. Of the various governmental policies that have guided the course of fertiliser marketing the following are especially noteworthy:

(i) The policy on prices which prescribes that fertilisers will be marketed at a uniform price throughout the country and that the maximum selling price will be controlled and statutorily notified by the government.

(ii) The policy on distribution which prescribes that distribution of the fertilisers shall take place as determined by the Government and statutorily notified under the ECA. As per this policy, specified products will have to be made available by the manufacturer in specified states in specified quantities in each crop season.

(iii) The policy on return on investment which prescribes the fair retention prices for each fertiliser manufacturer.

(iv) a) The policy on transportation which prescribes an equated freight for each manufacturer within which he has to carry on the transportation of his fertilisers. If the manufacturer spends more than the prescribed equated freight, that amount will not be reimbursed to him by the FICC which administers the retention prices and subsidies.

b) As a corollory to the above, the policy of prescribing the mix of transport modes (per centages share of rail and road) for moving the fertilisers from the factory to the marketing territories.

c) The policy which prescribes that all transportation by rail from the factory to the marketing territories shall be by unit train loads/ block rakes consigned to a single destination, i.e. by point to point full train load from where the manufacturers will have to take care of further dispersal of the stocks.

(v) The policy on channel compensation which specifies the distribution margins in respect of each fertiliser unit and each product that shall be payable to the channels of distribution - institutional as well as private channels.

(vi) The policy on terms of delivery which prescribes that all fertilisers shall be delivered to the channel by the manufacturers, freight paid up to the block head quarters or a rebate shall be given by the manufacturers towards block level transportation charges in lieu of actual delivery at block level.

Notwithstanding the tight controls by the government on every important aspect of fertiliser marketing, the domestic fertiliser manufacturers in the country have been permitted for years to carry out their marketing role. They have had freedom to develop their individual brands of the commodity, compete with one another and develop their own systems of marketing and channels of distribution. A healthy competition has also been permitted between domestic fertilisers as a group and imported fertilisers. As a result of this, fertiliser marketing in India presents almost a free enterprise situation, notwithstanding the governmental controls mentioned earlier. This is indeed a striking feature of the fertiliser marketing system in the country.

Fertiliser pricing -
a strategic function:

In the matter of fertiliser pricing, India is placed in a strategic predicament on account of the conflicting requirements involved in the task. On the one hand, there is the pressing requirement for keeping the prices of farm output sufficiently low so that the cost of food production and the prices of food articles would remain low. On the other hand, there is the requirement for keeping the prices of fertilisers sufficiently high so that the fertiliser manufacturers would find fertiliser production as an attractive and remunerative business activity.

A solution to this strategic predicament in fertiliser pricing has been sought by resorting to a system of remunerative retention prices to the fertiliser manufacturers and artifically suppressed prices for the farmers, the gap being met through state subsidies. This policy on fertiliser pricing appears to have so far served the objective reasonably well, but the question of how in the future, the ever growing gap between the real prices and the pegged down prices of fertilisers could be bridged remains unanswered.

Problems in transportation:

Transportation is a crucial function in fertiliser marketing. The quantity of fertilisers transported in India went up to 15 million MT. in 1981-82 from 1.8 million MT. in 1959-60. It is projected to go up to 23 million MT. in 1984-85 and to 33 million MT. in 1989-90. The sheer bulk of the product makes fertiliser transportation a complex and mammoth job. A variety of other factors such as the high seasonality of the use of the product, the locational imbalance between fertiliser production and consumption and the capacity limitations of the rail and road transport systems of the country add to the complexity of fertiliser transportation.

Rail and road are the main modes of transport for fertilisers. Generally the share of rail had been about 80 to 85 percent and the balance had been that of road in the primary transport of fertilisers. Secondary and terminal transport is totally by road. During the years 1978-79 and 1980-81, the share of rail came down drastically to around 60 percent mainly on account of capacity and productivity constraints in the rail system. Subsequently, the rail system showed some improvement in handling the fertiliser cargo. This was made possible largely by the introduction of the policy to move the cargo in full train loads on a point to point basis. While the improvement in the recent past in lifting the cargo is encouraging, capacity constraints are likely to continue in the movement of the fertiliser cargo.

Cost of transport is the most significant element among the various costs of fertiliser marketing. In 1982-83, the fertiliser business incurred on an average Rs. 168 per tonne towards cost of transport. It worked out to nearly 35 percent of the overall marketing costs incurred by the business. In fact, increase in the cost of transport has been a major contributor to the overall uptrend in the fertiliser marketing costs. The total cost of fertiliser transport went up from Rs. 186.5 crores in 1980-81 to Rs.251.5 crores in 1982-83.

The main reasons for the high cost of fertiliser transport are the long lead of the fertiliser traffic and the suboptimum mix of transport modes employed in the transportation of the cargo. Evidently, fertiliser transport costs can be reduced by choosing an optimal intermodal mix and by reducing the lead of the traffic through rationalisation of the distribution of the commodity.

As regards the choice of the model mix, there are a number of objective considerations for determining the optimal mix between rail and road. They include energy efficiency, resource cost to the economy, actual cost to the user, extent of availability and extent of user orientation. Rail has certain merits especially from the angle of energy efficiency and resource costs. But on the basis of actual cost to the user rail loses its advantage especially in view of the recent escalations in rail freight and the increase in the incidence of dispersal and terminal costs in rail movement due to the policy of restricting the movement to a few selected rake receiving rail heads in full train loads. Road transport is cheaper in the short and medium distance ranges. In addition it has certain other merits. These considerations have to be taken into account while determining the optimum intermodal mix. Similarly, the unit level considerations must also be taken into account. The same model mix may not be the optimum one for all the fertiliser units.

As regards rationalisation, there is great scope both in domestic fertilisers and imported fertilisers. The transportation model suggested by the R I T E S study can be a starting point in working out a rationalised pattern of fertiliser distribution in India. There is vast need and scope for restricting the marketing territories of the various fertiliser firms and for eliminating criss cross movement of fertilisers. Only by reducing the average lead travelled by the fertiliser cargo, the supply system in respect of this critical agricultural input can be maintained within reasonable cost limits.

Warehousing problems and inventory carrying costs:

Warehousing strategies and decisions play a very vital role in the distribution of fertilisers. Adequate storage of fertilisers close to points of consumption is an essential infrastructural requirement of fertiliser business. The problem is one of optimising the size and location of the inventory.

Of late, the fertiliser distribution channels in the country have been showing increasing reluctance to carry the fertiliser inventory, especially offseason inventory. It appears as though they are becoming mere brokers. The manufacturers are, therefore, forced to bear the brunt of inventory holding cost. Further, keen competition in the business has necessitated a liberal warehousing policy on the part of the manufacturers.

Inventory carrying costs have been steadily going up over the years. It is the third biggest component of the fertiliser marketing costs, next only to the costs of transportation and of dealer margins. During 1982-83, the fertiliser business spent an estimated amount of Rs. 257.4 crores on carrying the finished fertiliser products. If the subsidy on fertilisers is also reckoned as a part of the value of the fertilisers held in storage, the inventory carrying cost would work out to Rs. 299.2 crores. Interest is the most important element in fertiliser inventory cost. The inventory carrying cost in the fertiliser business is mounting up so much on account of (a) the sales to inventory ratio getting adversely affected and the level of stock holding going up; (b) the prices of fertilisers suffering steep increase; and (c) the rate of bank borrowings going up equally steeply.

Since the fertiliser business is highly seasonal and the volume handled is enormous, the offseason inventories would continue to pose a serious challenge to the business. As fertiliser consumption in the country goes up, year after year, the cost of carrying the inventory is bound to increase further. Every increase in fertiliser prices and every increase in the interest rates would aggravate the cost of carrying the inventory. It is evident that effective management of the inventory is a critical function in fertiliser marketing. It is possible to achieve substantial savings in the overall marketing costs of the fertiliser business by efficiently managing the inventory.

Basically, the inventory levels must be related to the inventory functions and the cost-benefit position of holding the inventories. A managerial approach to inventory carrying would mean the offsetting of the costs against the advantages of holding the stocks.

At the national level, the question to be answered is whether the contribution made by the fertiliser inventory to the country is more than what it costs the country to hold the stocks. Such a cost benefit analysis may bring out the weaknesses behind the assumptions based on which the high level of buffer stocks of fertilisers is held in the country.

It is not enough if the domestic fertiliser industry alone improves its inventory management. The pool, which handles the imported fertilisers must also practice sound techniques of inventory management and perhaps reduce the level of stocks. Since the pool is a part of the government activity, it does not feel the pinch of the inventory carrying costs in the same way as the various commercial firms engaged in the business feel. Unless the pool stocks are also held under check through better planning of imports, the overall fertiliser inventory levels in the country could not be maintained at optimum level, avoiding glut conditions as well as shortages.

In fact, analysis shows that one main reason for the high inventory is the absence of a systematic and coordinated approach to inventory management between the pool and the domestic industry. The sales inventory ratio in the business would have been far more encouraging if the domestic industry and the pool that handles the imported fertilisers, had together developed sound policies on fertiliser inventory and sound systems for its control.

Apart from effective inventory management, the business must evolve a way for avoiding the duplication of the inventory carrying function and the consequent double payment of inventory carrying costs. Presently the marketing system in the fertiliser business is compelled to incur the expenditure on inventory carrying twice. This is because, on the one hand, the distribution channels shirk their role in inventory carrying. They cleverly pass it on to the manufacturers. At the same time, with the introduction of government regulated margins from 15-8-1981 onwards, the manufacturers are also required to pay the full distribution margins to the channels, whether they fulfill their responsibility for inventory holding or not.

By delinking the stock holding responsibility from the channel it will be possible to contain, to an extent, the clamour for an increase in the distribution margins, every time an increase in the prices of fertilisers takes place. Stock holding cost being the one component of the total distribution costs that varies in proportion to the prices of fertilisers, a case for increasing the channel margins with every increase in prices can be made out only if the channel performs the stock holding function in the intended manner. When this function is delinked from the distribution margins the demand for an automatic increase in the margins with every increase in fertiliser prices will become unsustainable. In fact, it is the manufacturers' compensation on this account that must be increased every time a price increase takes place for, it is the manufacturer who has to bear the brunt of stockholding. If at all the channels come forward to discharge this burden the manufacturer can pass on the due compensation on this account to the channels.

Distribution Channels:

Distribution channels play a decisive role in fertiliser sales. The nature of the fertiliser business is such that without extensive channels of distribution, the fertilisers will not smooth flow from the factories to the farmers. The fertiliser firms in

India have by and large adopted a multi channel approach in the distribution of their fertilisers. And most dealers in fertilisers have adopted a multi brand approach in their business and deal simultaneously in different brands of fertilisers.

The nature of the business necessitates an extensive net work of sales outlets. As on 31-5-1980, there are about 110,000 sales outlets in the fertiliser business. The spread of the retail outlets in the interior parts, however, remains inadequate. At the same time, there is the problem of poor viability of the retail outlets acting as a catch against the fast expansion of the number of outlets. Most of the fertiliser firms have appreciated the pivotal role of the retail dealers in fertiliser sales and have developed suitable packages of compensation and other policy measures for motivating and developing the network of dealers.

The fertiliser business incurs a heavy expenditure towards channel compensation. The compensation is paid mainly in the form of distribution margins and credit facilities. Cash rebates are extended in lieu of credit. The compensation package also includes a variety of special rebates and discounts.

Distribution Margins:

The margins paid to the channel form the second largest component of the marketing costs in the business. If the various special rebates that are extended to the channels in addition to the regular distribution margins are also considered, channel compensation may even occupy the first position, among all elements of marketing costs, overtaking even the cost of transportation. The fertiliser business incurred an estimated Rs. 147 crores towards channel compensation during 1980-81. This includes the distribution margins as well as the cash equivalent of the credit facilities extended. The expenditure on this account during 1982-83 was substantially larger than the amount spent during 1980-81, both in absolute terms and in the amount spent per unit quantity of fertiliser distributed. This was so because of (i) the adhoc increase in margins that took place with effect from 15-8-1981; and (ii) the various special rebates extended by the firms to the channel during 1982-83 to promote sales under glut conditions.

From 15-8-1981 onwards government introduced its regulatory role in the matter of distribution margins. As per the new policy in this regard, the fertiliser firms are required to extend to the channels of distribution the margins notified by the government. The system also envisages that the institutional channels of distribution (mainly cooperatives) will have a larger margins - larger by rupees twenty per tonne of fertiliser - than the private channels.

The merits of the new system are debatable. Primafacie a strong rationale does not seem to exist for the government to assume responsibility to administer the dealer margins. Administering the margins is quite different from price administration which may perhaps be necessary in the existing context in the country. Similarly there is no strong case for a differentiated treatment in the matter of margins between institutional channels and private channels.

The quantum of margins allowed is in itself a point for debate. It appears that margins are given away to the channels without getting the intended functions done by them. In the context of nonperformance of some of the intended distribution functions, especially the most expensive function of offseason storage of the fertilisers, the margins being paid to the channels appear to be on the high side.

The economy of the fertiliser industry cannot afford to fix the distribution margins at too high a level. Unhealthy price war and inefficient marketing are the consequences of fixing the margins at too high a level. The fertiliser firms in the country are placed today in the unenviable position of having to pay the channel not only the full quantum of the margins notified by the government, but also additional compensation in various forms in view of the market glut and keen competition. Moreover, in the case of the fertiliser business, the funds required for paying the margins have to come from the public exchequer in the form of subsidy under the retention price system. The alternative to government subsidy will be an enhancement of the prices of fertilisers to meet the increase in distribution margins. This may not be expedient either. The need for containing the dealer margins will thus be evident.

It seems that most of the current controversies on distribution margins in the fertiliser business will get resolved if a functional approach to the issue is made. Infact, the functional approach to channels, has two major advantages. In the first place, by such an approach, the distribution functions could be rationally allocated between the principals and the channel. And those functions that are allocated to the channel could be further rationally divided over the different levels in the channels. Secondly, the total remuneration that is available could be allocated to the different levels in the channel in proportion to the distribution functions that are actually performed by the particular level.

If the existing practice of giving away the notified margins in full measure irrespective of whether the channels performi the intended functions or not is continued, and a justification in addition is also found for enhancing the margins from the existing levels, the inflationary pressure on fertiliser marketing costs may get an additional lease of life. It would be unwise to jack up the margins still further without ensuring the due performance of the intended functions by the channel. What is required on the other hand is a proper evaluation of the distribution functions performed by each type of channel members and disbursement of margins to each of them in relation to the functions performed by them. Since it seems difficult to ensure the performance of the stock holding function by the channel, it would be advisable to keep the margin at a low level and to compensate the manufacturer for the stock holding responsibility, with the option of passing it on to the channel if the manufacturer is satisfied about the performance of the channel in that respect. Under this approach the case is for a downward revision of the distribution margins and not for an upward revision.

Marketing costs:

Marketing costs form a sizable part of the total costs in the fertiliser business. In 1980-81, in the case of the fertilisers covered by the retention price system, the marketing costs excluding packaging costs formed 14 percent of the ultimate prices of fertilisers. When packaging costs are also included, the marketing costs formed more than 18 percent of the ultimate prices of fertilisers.

In absolute terms, the marketing costs incurred by the entire fertiliser business of India in 1980-81 totalled Rs.541.5 crores, excluding the costs of packaging. Of this, the domestic fertilisers under the retention price system accounted for Rs. 234 crores. The domestic fertilisers that are outside the retention price system accounted for Rs. 46.5 crores; and the imported fertilisers accounted for Rs. 261 crores. The marketing costs in respect of imported fertilisers is so high, mainly because the government, as a matter of deliberate policy, is holding a large inventory of imported fertilisers as buffer stocks.

The marketing cost worked out to Rs. 422 per tonne of fertilisers sold in 1980-81. It worked out to Rs. 368.40 per tonne in the case of the domestic fertilisers covered by the retention price system, Rs. 246 per tonne in the case of domestic fertilisers that are outside the retention price system and Rs. 567 per tonne in the case of imported fertilisers.

Between 1980-81 and 1982-83, there has been a considerable increase in marketing costs in the fertiliser business. The total marketing costs in the business went up from Rs. 541.5 crores in 1980-81 to Rs. 797 crores in 1982-83.

It is also to be noted that the increase in marketing costs between 1980-81 and 1982-83 has been more than proportionate to the increase in the volume of fertilisers marketed. In other words, there has been an uptrend in the cost per unit quantity of fertiliser marketed. The marketing costs per tonne in 1980-81 was Rs. 422. In 1982-83 it went up to Rs. 533.

Transport cost, dealer margins and inventory carrying costs are the three most significant components of fertiliser marketing costs in India. These three components together account for 87 percent of the total marketing costs in the business. Other items of marketing costs are not equally significant in the marketing and distribution of fertilisers.

There are wide variations in marketing costs from firm to firm in the fertiliser business. The marketing cost per unit quantity in 1980-81 varied from Rs. 245/- in the case of Gujarat State Fertiliser Company (GSFC) to Rs. 543/- in the case of Indian Farmers' Fertiliser Cooperative Ltd. (IFFCO). The variations are equally pronounced even when each individual item of marketing costs is considered separately. For example, with regard to transport and handling costs, four firms have managed to stay within the limits of Rs. 81 to Rs. 95 per MT. Three firms have incurred more than Rs. 160 per MT. Taking distribution margins, the expenditure varies from Rs. 100 per MT. in the case of GSFC to Rs. 161 per MT. in the case of IFFCO. When we consider 'other marketing costs' which is synonymous with 'marketing overheads', IFFCO, again tops the list with Rs. 130 per MT. whereas Sriram Fertilisers has incurred only Rs. 15 per MT.

There are many reasons for the wide interfirm variations in marketing costs in the fertiliser business. In the first place, there are significant variations in the marketing and distribution functions performed by the different firms. Further, the same function is performed to varying levels of efficiently by the different firms. Such variations in functions and the manner of carrying them out are rooted in turn, in the differences in the marketing objectives chosen by the firms and the marketing patterns adopted by them. These variations explain a part of the wide difference in the marketing costs of the different firms. Another part of the interfirm variations in marketing costs is explained by the inherent marketing advantages enjoyed by some firms and the inherent marketing disadvantages suffered by some others, in terms of location, product mix, etc. A further reason for the interfirm cost variations is the difference in the marketing efficiency between one firm and another.

The marketing costs in the fertiliser business do not seem to be fully justified by the nature of the functions involved in marketing the commodity, difficult and expensive as they no doubt are. Nor does it appear correct to attribute in full the uptrend in the marketing costs to the general hike in costs resulting from the overall inflation in the economy. On the contrary it would appear that a substantial part of the increase in the fertiliser marketing costs is due to reasons that are internal to the business.

For example, fertiliser transport cost is high not merely because the freight rates in rail and road transport systems are high and are going higher, but also because the fertiliser business incurs a good deal of avoidable expenditure on transport. Such expenditure cannot be justified by objective criteria.

Similarly as was noted earlier, the high cost of inventory carrying is not fully justified by objective criteria. It is admitted that the high level of inventory carrying cost is contributed in a large measure by factors like the seasonal nature of fertiliser use, the high prices of fertilisers and the high rates of interest ruling at present. Yet, by proper coordination between the pool and the domestic fertiliser industry, the overall fertiliser inventory in the country could have been kept down. If this had been done it would merely have been a question of reckoning which agency was required to hold how much of the total inventory as a part of the overall policy and how much of compensation on this account should go to the respective agency. Thereby, the total inventory carrying costs incurred by the country could have been contained at a lower level. Moreover, through better inventory policies and better inventory control techniques both the pool and the domestic industry could have reduced their respective inventory carrying costs.

As regards distribution margins too, it appears that efforts could have been made to contain them. The business incurs double expenditure on some of the distribution functions. For example, the cost of off season inventory holding is, to an extent, built into the distribution margins. But since the distribution channels do not perform this function to the extent intended, the inventory holding expenditure is incurred twice by the business - by way of interest on inventory actually held as well as by way of distribution margins. Similar is the case with secondary transport cost.

The need for containing the marketing costs

It is highly essential that the marketing costs in the fertiliser business are contained at a reasonable level. The alternatives to cost reduction are an increase in the delivered prices of fertilisers to the farmers and a consequent increase in the prices of food grains to the common man or an increase in the subsidies on fertilisers and food and the consequent addition to the drain of funds from the public exchequer.

Neither of these alternatives would be desirable. Also, if there is no systematic and uniform type of effort to reduce marketing costs, the result would be haphazard attempts by the industry to control some one or other of the elements of marketing costs which might lead to inefficient and defective distribution.

While reduction in marketing costs is essential, the quality of marketing service should not get sacrified in the process. A minimum cost has to be inevitably incurred for performing the essential marketing functions and for providing an essential marketing service to the channel or the customer. Marketing cost reduction programmes should not be implemented without looking into its possible adverse impact on the quality of marketing services.

It seems possible to achieve simultaneously the twin objectives of containing the marketing costs and improving the marketing service through more efficient and innovative marketing efforts. But this requires a perfect identity of interests and perfect coordination in marketing approaches between the government and the industry. Government policies exercise a great impact on fertiliser marketing in India. Government is also a direct partner in the fertiliser marketing system. The marketing of imported fertilisers is entirely in the hands of the government. Any effort at cost reduction in marketing will have to be a matter of shared concern between the government and the industry.

It seems that a systems approach could be applied to great advantage in controlling the fertiliser marketing costs. The various functions of fertiliser marketing such as transportation inventory management and channel management interact closely with one another. Similarly the various elements in fertiliser marketing costs are closely interrelated with one another. Marketing cost control will get fragmented if the interrelated, interacting and interdependant cost elements are considered one at a time and in isolation for the purpose of control. If the decisions on the various functions and the costs there of are taken in a system frame work, marketing cost control will be effective. To facilitate such an approach, it is essential to view fertiliser marketing as a single unified function stretching from the factory to the farmer.

APPENDIX - I

List of Libraries perused

(1) University Library, University of Cochin, Cochin.

(2) Library of the School of Management Studies, University of Cochin, Cochin.

(3) Library of the Fertiliser Association of India, New Delhi.

(4) Library of the Department of Chemicals and Fertilisers, Government of India, New Delhi.

(5) Library of the Department of Agriculture, Government of India, New Delhi.

(6) Library of the Indian Council of Agricultural Research, New Delhi

(7) Library of the Fertiliser (Planning & Development) India Ltd., New Delhi.

(8) Library of FACT Management Development Centre, Kalamassery.

(9) Documentation Centre, FACT Engineering & Design Organisation, Udyogamandal.

(10) Library of Madras Fertilisers Ltd., Madras.

(11) Library of the Planning Commission, Government of India, New Delhi.

RESEARCH STUDY

on

'MARKETING OF FERTILISERS IN INDIA'

QUESTIONNAIRE TO FERTILISER MANUFACTURERS

1. SALES DATA

Please give details of fertilisers SOLD in '79-'80 and '80-'81 - Product-wise, State-wise and channel type-wise in the table given below. Please use one such table for each product. The required number of copies of the Table are attached.

NAME OF THE FERTILISER: ....

S.No.	Name of the State	QUANTITIES SOLD (rounded to '000 M.T.)			
		INSTITUTIONAL AGENCIES		PRIVATE CHANNELS	
		79-80	80-81	79-80	80-81
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
	TOTAL:				

2. TRANSPORTATION

2.1 What is the total quantity of fertilisers (all fertilisers put together) moved out from your factory during 1979-80 and 1980-81? How much was moved by rail and how much was moved by road? (Primary movement from the factory)

Year	Quantity moved (M.T.)	
	Rail	Road
1979 - 80		
1980 - 81		

2.2 What was the average lead of transport? (State-wise and Product-wise details are not required. Company average for all products and states put together will do. Primary transport lead alone will do)

Year	Average transport lead (KM)	
	Rail lead	Road lead
1979 - 80		
1980 - 81		

3. WAREHOUSING

3.1 What is your present warehousing capacity at your FACTORY?

In M.T.

(a) In Bulk form :

(b) In bagged form :

3.2 In the field, how many warehouse points do you have?

Total number :

3.3 What is the total capacity of all the field warehouses put together?

Total capacity : M.T.

3.4 What was your average inventory in your factory and in your field warehouses? (Produce-wise)

Name of the fertiliser product	'Average stock' at factory (product wise)		'Average stock' in all the field warehouses put together (product-wise)	
	79-80	80-81	79-80	80-81
1.				
2.				
3.				
4.				
5.				
Total:				

379

4. MARKETING COSTS

Please furnish below the details of expenditure incurred by you on the marketing of your products during 79-80 and 80-81 under each of the following heads. Please give the TOTAL amount and NOT the PER M.T. cost. Please give the total expenditure on all fertiliser products put together.

	Total expenditure incurred (in Rs. rounded to ~~1000)~~ lakhs	
	1979-80	1980-81
4.1 Expenditure on TRANSPORT AND HANDLING		

Please include under this head all expenditure incurred by you on the physical distribution of your products. This may include primary freight, whether Rail or Road, Road bridging at rake points, inward handling from rail heads to warehouses, transfer from warehouse to warehouse, secondary transport from s~~tock points~~/warehouses to dealers'/distributors' places and loading and unloading charges at all stages. Please also include under this head the transport rebates/transport subsidies that were allowed by you to the channel whatever be the channel, cooperative or private, wholesale or retail.

4.2 Expenditure on DISTRIBUT~~OR~~ION MARGINS:

Please give under this head the total expenditure on distribution margins/ commissions/discounts/rebates passed on to distributors/dealers/marketers/institutional agencies/bulk consumers etc. etc. Please include not only the ~~regular distribution~~/usual dealer's margin but also all the rebates such as cash rebates, quantity rebates, off-season rebates and any other rebates actually passed on. But please do not include the transport rebate which is already included under 4.1.

4.3 Expenditure on PROMOTION:

Please give the total expenditure on advertising, sales promotion, publicity, public relations, agronomy, technical services, extension etc.

4.4 Expenditure on carrying the INVENTORIES:

Please give under thishead the cost of Finance i.e. interest charges ~~on holding~~ incurred on the inventories (factory stocks + field stocks + transit stocks) Please do not include the godown

rent here

	Total expenditure incurred (in Rs. rounded to ~~1000)~~ lakhs)	
	1979-80	1980-81
4.5 All other marketing costs All costs on marketing other than 1, 2, 3 and 4 above. Please include here expenses such as salaries, wages, P.F., T.A., Rates and taxes, head office over-heads, marketing over heads, insurence, cost of credit extended etc. etc.		
4.6 Grand total of MARKETING COSTS : (Total of 4.1 to 4.5)		
4.7 Total quantity of fertilisers sold (M.Tonnes) (All products put together)		
4.8 Marketing cost ~~/M.T.~~ per M.T = 4.6 ÷ 4.7		
4.9 Sales value (Rs.lakhs after subtracting sales tax, subsidy under retention price etc.)		
4.10 Marketing Expenditure as a % to Sales Value = $\frac{4.6}{4.9} \times 100$ =		

Appendix - III

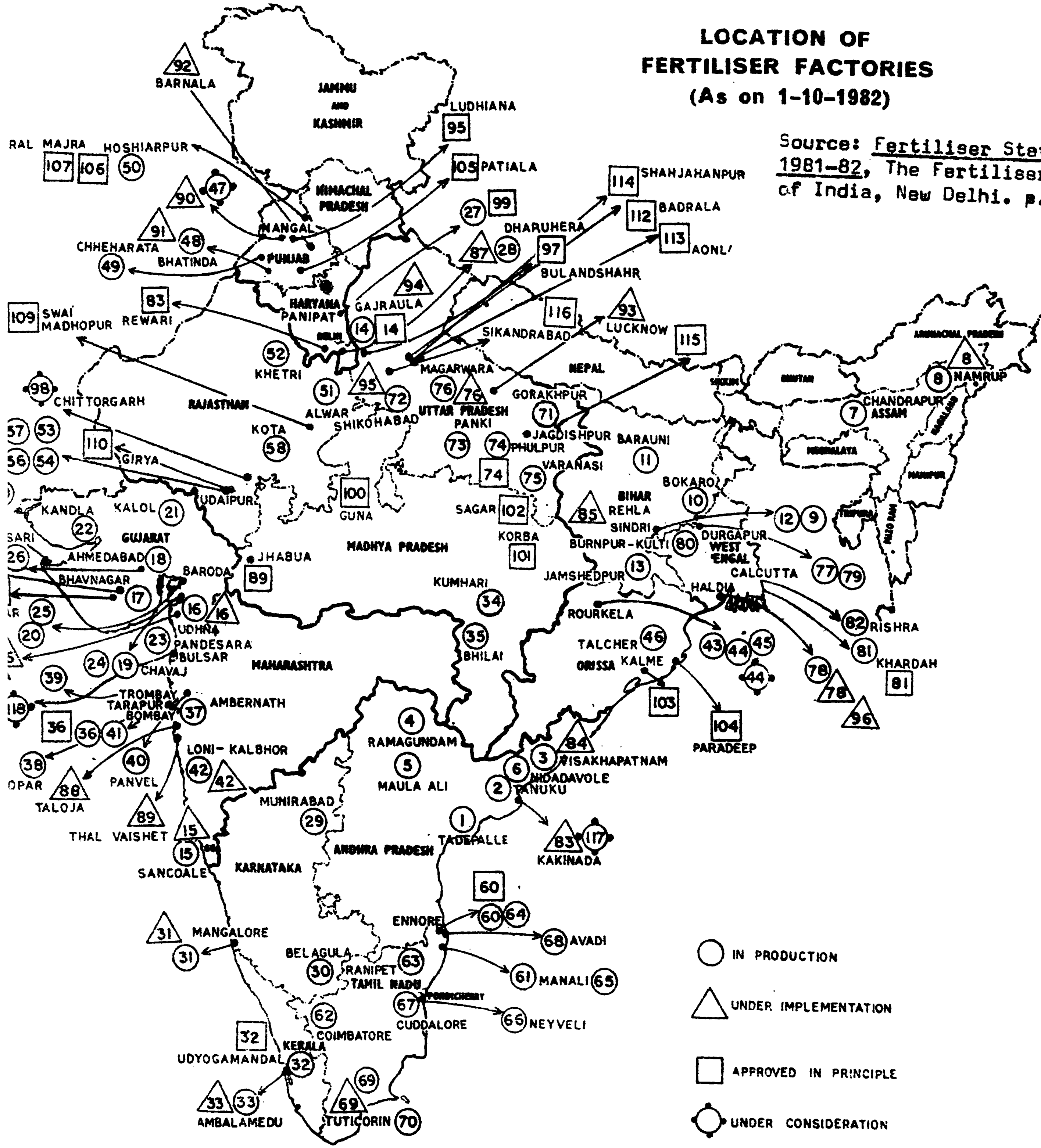
India's ranking in area and yield in 1977

Crop	Area under crop (In million Hectares)	Yield per Hectare (Kg.)	International ranking: Area	International ranking: Productivity
1. Barley	2.235	1035	11	42
2. Maize	6.000	1133	4	38
3. Millet	18.500	541	2	43
4. Rice Paddy	39.500	1873	1	36
5. Sorghum	16.00	650	1	41
6. Wheat	20.863	1394	4	35
7. Beans Dry	9.00	300	1	50
8. Pulses	23.587	485	1	46
9. Onions (Dry)	.212	7517	1	39
10. Tomatoes	.075	9505	7	46
11. Potatoes	.634	11494	4	36
12. Castor Beans	.487	353	1	23
13. Groundnuts	7.000	786	1	37
14. Linseed	1.925	224	1	34
15. Rapeseed	3.145	497	1	34
16. Sesameseed	2.300	196	1	53
17. Soya Beans	.160	749	14	34
18. Sugarcane	2.771	50590	1	43
19. Tobacco	.432	960	2	35
20. Tea	.364	1538	1	3
21. Coffee	.155	542	15	26
22. Rubber	.224	658	6	7

Source: FAO Agricultural Crop Statistics, cited by Chaco V.I. "Rural Development and modernisation of Indian agriculture in Arvind Deshpande & Bapat S.B (ed) <u>Indian Agriculture - Performance and Potential</u>, Jaico, Bombay 1980. p.163

LOCATION OF FERTILISER FACTORIES
(As on 1-10-1982)

Source: Fertiliser Statistics 1981-82, The Fertiliser Association of India, New Delhi. p.I - 19



APPENDIX - ~~VI~~. V

1.03. SHARE OF FERTILISER CAPACITY UNDER VARIOUS STAGES OF IMPLEMENTATION-
NUTRIENTWISE AND SECTORWISE

(As on October, 1, 1981)

('000 tonnes of nutrient per annum)

Category	N				P_2O_5			
	Public sector	Private sector	Coop.sector	Total	Public sector	Private sector	Coop.sector	Total
1. Factories in production	2,843.1 (60.0)	1,399.8 (29.6)	493.0 (10.4)	4,735.9 (100.0)	688.7 (45.6)	571.0 (37.8)	252.0 (16.6)	1,511.7 (100.0)
2. Projects under implementation	1,010.5 (51.2)	273.0 (13.8)	690.0 (35.0)	1,973.5 (100.0)	75.0 (73.2)	27.5 (26.8)	- (—)	102.5 (100.0)
3. Projects approved in principle	500.0 (61.5)	312.9 (39.5)	- (—)	812.9 (100.0)	321.2 (61.0)	194.5 (39.0)	- (-)	515.7 (100.0)
4. Projects under consideration				2,120.0* (100.0)	414.3 (70.2)	176.0 (29.8)	- (-)	590.0 (100.0)
TOTAL	4,353.6	1,985.7	1,183.0	9,642.3 (100.0)	1,499.2 (55.1)	969.0 (35.6)	252.0 (0.3)	2,720.2 (100.0)

Figures in brackets indicate the percentage contribution through the sector to the total (horizontal)

* Sectorwise breakup is not yet determined.

Source: Fertiliser Statistics 1980-81
op.cit; p. I-15

APPENDIX - VI

Installed Capacity, Actual Production and Percentage utilisation of capacity

Year	Installed Capacity		Actual Production		Percentage Capacity Utilisation	
	N.	P.	N.	P.	N.	P.
1973 - 74	1950	542	1050	325	54	60
1974 - 75	2196	592	1187	331	60	58
1975 - 76	2676	742	1508	320	63	45
1976 - 77	3037	1024	1862	478	64	56
1977 - 78	3189	1024	2000	671	65	65
1978 - 79	3274	1117	2173	778	69	71
1979 - 80	3902	1284	2224	763	61	65
1980 - 81	4586	1330	2164	841	53	65

Source: Fertiliser Statistics, op, cit; various issues.

mp.

APPENDIX - VII

Statewise production of fertilisers - 1981-82.

State	Production of fertilisers (in '000 M.T. of nutrients)		
	N	P	N + P
Madhya pradesh	6	22	28
Rajasthan	121	20	141
Uttar pradesh	454	9	463
Delhi	-	17	17
Assam	105	1	106
Bihar	201	21	222
Orissa	101	-	101
West Bengal	63	16	79
Haryana	182	-	182
Punjab	304	6	310
Andhra Pradesh	130	90	220
Karnataka	119	4	123
Kerala	172	59	232
Tamilnadu	413	207	620
Gujarat	460	303	763
Maharashtra	168	139	307
Goa, Daman & Diu	144	36	180
All India	3143	950	4093

Source: Fertiliser Statistics, 1981-82, op.cit
pp I 195 & 196

APPEMDIX - VIII

Productwar details of production - 1981-82

Fertiliser product	Production in '000 M.T.
Ammonium Sulphate	443
Urea	5384
CAN	404
Ammonium Chloride	19
16:20:0	105
19:19:19	116
20:20:0	299
24:24:0	35
28:28:0	297
17:17:17	603
15:15:15	283
14:28:14	45
14:35:14	34
10:26:26	111
12:35:16	662
18:46:0	278
S.S.P	1203
T.S.P.	48
Total of all products :	10369

Source: Fertiliser Statistics - 181-82; op.cit; pp.I.52 & 53.

APPENDIX -IX

State-wise and Zone-wise consumption of fertilisers - 1981 - '82

State / Zone	Consunption N + P + K (in '000 MT)
Madhya Pradesh	236
Rajasthan	138
Utter Pradesh	1270
CENTRAL ZONE	1653
Assam	11
Bihar	205
Orissa	82
West Bengal	258
EAST ZONE	566
Haryana	252
Himachal Pradesh	18
Jammu & Kashmir	22
Punjab	821
NORTH ZONE	1113
Andhra Pradesh	656
Karnataka	384
Kerala	95
Tamil Nadu	513
SOUTH ZONE	1660
Gujarat	401
Maharashtra	529
WEST ZONE	935
ALL INDIA	6067

Source: Fertiliser News, July 1982,
The Fertiliser Association of India, New Delhi. p. 117.

mp.

APPENDIX - X.

Ranking of states in fertiliser consumption and the share of each state to all India consumption

1981 - 82

State (as per descending order of ranking)	Percentage share of consumption of the state to the national consumption
Uttar Pradesh	20.9
Punjab	13.5
Andhra Pradesh	10.8
Maharashtra	8.7
Tamilnadu	8.4
Gujarat	6.6
Karnataka	6.3
West Bengal	4.3
Haryana	4.1
Madhya Pradesh	3.9
Bihar	3.4
Rajasthan	2.3
Kerala	1.6
Orissa	1.4
Jammu & Kashmir	0.4
Himachal Pradesh	0.3
Assam	0.2
Other States/UTs/Plantations	2.9
ALL INDIA	100.0

Source: Fertiliser News, July, 1982 op.cit; p.120

APPENDIX - XI

IMPORTS OF FERTILISERS 1970-71 TO 1981-82

Year	N (in '000 M.T)	P	K	Value (Rs. in million)
1970-71	477.0	32.0	120.0	767.9
1971-72	481.0	248.0	268.0	899.7
1972-73	665.0	204.0	325.0	1212.6
1973-74	659.0	213.0	370.0	1767.5
1974-75	684.0	286.0	437.0	5991.3
1975-76	996.0	361.0	278.0	7227.7
1976-77	750.1	22.8	277.8	2202.2
1977-78	758.1	163.9	598.9	3064.4
1978-79	1233.1	244.0	517.4	4600.2
1979-80	1295.3	237.1	473.3	5545.0
1980-81	1510.4	452.1	796.5	9252.2
1981-82	1055.1	343.2	643.8	7166.3

Source: Fertiliser statistics, 1981-82
op.cit ; P.I - 188.

mp.

Appendix - XII

Gap between fertiliser consumption and domestic production - 1974 - 75 to 1980 - 81

Year	Consumption ('000 tonnes)			Production ('000 tonnes)			Gap ('000 tonnes)			Gap as percentage of consumption		
	N	P_2O_5	Total N + P_2O_5	N	P_2O_5	Total N + P_2O_5	N	P_2O_5	Total N + P_2O_5	N	P_2O_5	Total N + P_2O_5
1974-75	1765.7	471.5	2237.2	1186.6	331.2	1517.8	579.1	140.3	719.4	32.8	29.8	32.2
1975-76	2148.6	466.8	2615.4	1508.0	319.7	1827.7	640.6	147.1	787.7	29.8	31.5	30.1
1976-77	2457.1	635.3	3092.5	1862.4	478.3	2340.7	594.7	157.0	751.7	24.2	24.7	24.3
1977-78	2913.1	866.6	3779.7	1999.8	669.0	2669.7	913.3	196.7	1110.0	31.3	22.7	29.4
1978-79	3419.5	1106.0	4525.5	2173.0	778.0	2951.0	1246.5	328.0	1574.5	36.5	29.7	34.9
1979-80	3498.1	1150.9	4649.0	2224.3	763.1	2987.4	1273.8	387.8	1661.6	36.4	33.7	35.7
1980-81	3678.1	1213.6	4891.7	2163.9	841.5	3005.4	1514.2	372.1	1886.3	41.2	30.7	38.6

Source: Fertiliser News, July, 1982; The Fertiliser Association of India, New Delhi, P.82.

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APPENDIX - XIII.

RETENTION PRICES FIXED FOR UREA AS ON 1--11--1977

Fertiliser Unit	Price (Rs/M.T)
IFFCO, Kalol	948.00
GSFC, Baroda	1,006.00
ZUARI, Goa	1,160.00
SRC, Kotah	1,200.00
MFL, Madras	1,206.00
FCI, Namrup	1,231.00
MCF, Mangalore	1,253.00
ICL, Kanpur	1,262.00
SPIC, Tuticorin	1,335.00
FACT, Cochin	1,436.00
FCI, Gorakhpur	1,499.00
FCI, Trombay	1,565.00
FCI, Durgapur	1,571.00
FCI, Nangal	1,693.00
FCI, Taichar	1,796.00
FCI, Barauni	1,821.00
FCI, Ramagundam	1,829.00
NFL, Panipat	2,111.00
NFL, Batinda	2,129.00
FCI, Sindri	2,187.00
NLC, Neyveli	2,261.00

Source: Government of India; Notification No.166/24/77 FD(A) dt. 1-11-1977 of the Ministry of Chemicals and Fertilisers, Government of India; New Delhi, 1977.

<u>APPENDIX - IIV.</u>

<u>TEN YEAR PATTERN OF CONSUMER PRICES OF MAJOR FERTILISERS</u> (Rs.per MT)

Price as on:	1-4-71	1-4-72	1-4-73	1-4-74	1-4-75	1-4-76	1-4-77	1-4-78	1-4-79	8-6-80	11-7-81
<u>Name of Fertilisers:</u>											
Urea (46%)	923	959	959	15[illegible]	2000	1750	1650	1550	1450	2000	2350
D A P	1217	1246	1246	1335	3005	2600	2210	2210	2200	3050	3600
Muriate of Potash (100 Kg.pack)	523	543	543	670	1220	900	795	795	795	1090	1300
Ammonium Sulphate (50 Kg.pack)	540	56[illegible]	560	6[illegible]	935	935	935	935	900	Decon-trolled	Decon-trolled
Calcium Ammonium Nitrate (26% N)	575	594	594	645	1145	1060	1060	1060	1040	Decon-trolled	Decon-trolled

Note:- Eventhough the prices of A/S, and CAN are decontrolled for the domestic production, with effect from 8-6-80, GOI have fixed the price for these products as far as the imported stocks are concerned. These prices are -

A.S. Rs.1500/- per MT with effect from 2-7-80

C.A.N. Rs.1614/- per MT with effect from 2-7-80

Source: Fertiliser Statistics, 1981-82 op. cit; p.I-153.

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APPENDIX – ~~XXXII~~ XV

Railway Freight Rates for Chemical Manures—Divisions A and B (Rs./tonne)
(For wagonload)

Distance (km.)	15% supplementary charge w.e.f. 1.4.81	Upgrading of category[1][2]	Increase over 1.4.81 (%)	Additional[3] supplementary charge w.e.f. 1.1.82	Increase over 1.4.81 (%)	Additional 15% supplementary charge w.e.f. 1.4.82	Increase over 1-4-81 (%)
(1)	(2)	(3)	(4)=(3/2)	(5)	(6)=(5/2)	(7)	(8)=(7/2)
Division A—Urea, DAP, NP/NPKs etc.							
	(Category 52.5)						
100	21.90	23.60	7.8	27.90	27.4	32.10	46.6
300	42.00	45.50	8.3	54.10	28.8	62.30	48.3
500	60.20	65.40	8.6	77.80	29.2	89.40	48.5
800	97.70	106.50	9.0	132.50	35.6	152.40	56.0
1000	115.80	126.40	9.2	157.70	36.2	181.40	56.6
Division B—A/S, CAN, SSP, etc.							
	Category 45						
100	19.20	20.90	8.9	25.00	30.2	28.70	49.5
300	36.50	40.20	10.1	48.10	31.8	55.30	51.5
500	52.00	57.50	10.6	69.10	32.9	79.40	52.7
800	84.30	93.20	10.6	117.30	39.1	134.90	60.0
1000	100.10	110.40	10.3	139.30	39.2	160.20	60.0

[1] from 52 5 to 57.5 w.e.f. 14.8.81 for Division A

[2] from 45 to 50 w.e.f. 15.6.81 for Division B.

[3] 10% upto 500 km. and 15% beyond 500 kms.

Source: *Fertiliser Marketing News* March 1982,
The Fertiliser Association of India, New Delhi . p.5.

APPENDIX - X.VI.

Quantity of fertilisers transported by selected fertiliser firms in 1980 - 1981

Unit	Product	Quantity transported in 1980-81 (in '000 M.T.)
GSFC	Urea	296
GSFC	18:46:0	93
RCF	Urea	101
RCF	20:20	248
RCF	15:15:15	263
SFC	Urea	254
MFL	Urea	149
MFL	17:17:17	462
MFL	14:28:14	61
MFL	24:24:0	35
MCF	Urea	182
IEL	Urea	284
FACT	Urea	246
FACT	17:17:17	115
FACT	28:28:0	46
FACT	18:46:0	37
FACT	16:20:0	132
FACT	20:20:0	49
SPIC	Urea	401
SPIC	18:46:0	125
IFFCO	Urea	354
IFFCO	10:26:26	123
IFFCO	12:32:16	499

Note: In all cases, quantities produced in the year have been taken as quantities transported in the year.

Fertiliser Statistics, 1980-81, p.I-4 to I-6

APPENDIX - XVII.

Equated freight for fertilisers under retention price system - 1982-83

A. UREA

Unit	Equated Freight (Rupees per tonne)
NFL, Nangal	96
NFL, Bhatinda	81
NFL, Panipet	85
RCF, Trombay	149
HFC, Barauni	93
HFC, Durgapur	91
HFC, Namrup	235
FCI, Gorakhpur	97
FCI, Ramagundam	180
FCI, Talcher	192
FCI, Sindri	184
FACT, Cochin	193
MFL, Madras	115
NLC, Neyveli	109
IFFCO, Kalol	189
IFFCO, Phulpur	135
GSFC, Baroda	122
GNFC, Bharuch	171
MCF, Mangalore	154
SPIC, Tuticorin	220
ZACL, Goa	182
SFC, Kota	142
IEL, Kanpur	120

contd..

APPENDIX - XVII. (contd.)

B. COMPLEX FERTILISERS

Unit	Grade of fertiliser	Equated freight (Rupees per tonne)
RCF	15:15:15	191
RCF	20:20:0	211
FACT	16:20:0	146
FACT	20:20:0	244
FACT	17:17:17	171
FACT	28:28:0	239
FACT	18:46:0	230
MFL	17:17:17	120
MFL	14:28:14	136
MFL	24:24:0	148
MFL	18:46:0	274
IFFCO	10:26:26	257
IFFCO	12:32:16	257
GSFC	18:46:0	99
SPIC	18:46:0	164
ZACL	28:28:0	201
ZACL	19:19:19	174
ZACL	14:35:14	168
ZACL	18:46:0	177
CFL	28:28:0	164
CFL	14:35:14	164
CFL	18:46:0	164
EID, Parry	16:20:0	125
FCI, Sindri	0:46:0	203
Hindustan Copper	0:46:0	135

APPENDIX - XVIII

Details of domestic fertilisers transported during 1980-81 & 1981-82

Product	Quantity transported	
	1980-81	1981-82
(A) Domestic fertilisers outside retention prices		
S S P	11.01	12.10
A S	4.39	4.43
C A N	3.47	4.04
	18.87	20.57
(B) Domestic fertilisers under retentions prices.		
(all products put together)		82.80

Fertiliser Statistics, 1980-81 & 1981-82.

APPENDIX - XIX.

Details of imported fertilisers transported during 1980-81 & 1981-82

Product	Quantity distributed ('000 MT)	
	1980-'81	1981-'82
Urea	2,768.6	1,544.3
A.S.	82.6	46.8
C A N	162.9	61.6
D A P	549.5	477.5
M O P	1,015.5	1,108.3
S O P	14.6	11.0
Total:	4,593.7	3,249.5

Fertiliser Statistics, 1980-'81 and 1981-'82 pp.I. 60-72 & 63-74.

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APPENDIX - XX

Computation of weighted average transport cost during 1962-83 in respect of fertilisers under retention pricing.

Unit / Product		Freight per tonne	Quantity transported	Total freight
		Rs.	MT	Rs.
F.C.I.				
Gorakhpur	- Urea	97	159100	1,54,32,700.00
Sindri	- Urea	184	238900	4,39,57,600.00
Ramagundam	- Urea	180	128000	2,30,40,000.00
Talcher	- Urea	192	99500	1,91,04,000.00
Sindri	- TSP	203	43500	88,30,500.00
H.F.C.				
Barauni	- Urea	93	161200	1,49,91,600.00
Durgapur	- Urea	91	130200	1,18,48,200.00
Namrup	- Urea	235	212000	4,98,20,000.00
N.F.L.				
Nangal	- Urea	96	267100	2,56,41,600.00
Bhatinda	- Urea	81	290700	2,35,46,700.00
Panipat	- Urea	85	395900	3,36,51,500.00
R.C.F.				
Urea		149	157300	2,34,37,700.00
15:15:15		191	283100	5,40,72,100.00
20:20		211	255200	5,38,47,200.00
F.A.C.T.				
Urea		193	258300	4,98,51,900.00
16:20		146	55300	80,73,800.00
20:20		244	43800	1,06,87,200.00
17:17:17		171	101800	1,74,07,800.00
28:28		239	22200	53,05,800.00
18:46		230	28100	64,63,000.00
N.L.C.				
Urea		109	98300	1,07,14,700.00
IFFCO				
Kalol	- Urea	189	354200	6,69,43,800.00
Phulpur	- Urea	135	398200	5,37,57,000.00
Kandle	- 10:20:26	257	111100	2,85,52,700.00
Kandle	- 12:32:16	257	661500	17,00,05,500.00
G.S.F.C.				
Urea		122	319300	3,89,54,600.00
18:46		99	88400	87,51,600.00

APPENDIX - XX (Contd....)

Unit / Product	Freight per tonne	Quantity transported	Total freight
	Rs.	MT	Rs.
G.N.F.C.			
U r e a	171	5100	8,72,100.00
I.E.L.			
U r e a	120	439200	5,27,04,000.00
S.F.C.			
U r e a	142	263300	3,73,88,600.00
M.F.L.			
U r e a	115	114900	1,32,13,500.00
17:17:17	120	501000	6,01,20,000.00
14:28:14	136	44700	60,79,200.00
24:24	148	35400	52,39,200.00
18:46	274	-	-
C.F.L.			
28:28	164	240600	3,94,58,400.00
14:35:14	164	20800	34,11,200.00
18:46	164	4400	7,21,600.00
M.C.F.			
U r e a	154	258400	3,97,93,600.00
S.P.I.C.			
U r e a	220	394600	8,68,12,000.00
18:46	236	137000	3,23,32,000.00
EID Parry			
16:20	125	50000	62,50,000.00
ZUARI			
U r ea	182	239700	4,36,25,400.00
28:28	201	34500	69,34,500.00
19:19:19	174	117900	2,05,14,600.00
14:35:14	168	12500	21,00,000.00
18:46	177	-	-
HINDUSTAN COPPER			
TSP	135	3600	4,86,000.00
GRAND TOTAL :		8279800	133,47,46,700.00

Weighted Average Freight / MT = Rs.161.21

NOTE:- (1) Equated freight allowed by FICC for 1982-83 has been taken as the cost of transport per tonne.

(2) Quantities transported during 1981-82 have been reckoned.

(3) Quantities produced during the year are reckoned as quantities transported.

(4) Quantities have been taken from Fertiliser Statistics - 1981-82 Page I - 2 & 3

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APPENDIX - XXI

5.02. STORAGE ACCOMMODATION WITH THE FOOD CORPORATION OF INDIA

('000 tonnes)

State	Available on 31-12-78			Available on 31-12-79			CAP storage available with FCI
	Owned	Hired	Total	Owned	Hired	Total	
Andhra Pradesh	424	807	1,231	486	778	1,264	1,152
Assam	174	219	393	181	184	365	—
Bihar	285	357	642	329	365	694	300
Delhi	166	24	190	168	20	188	31
Gujarat	196	465	661	196	395	591	—
Haryana	354	496	850	360	703	1,063	214
Himachal Pradesh	—	14	14	—	16	16	—
Jammu & Kashmir	14	28	42	24	15	39	17
Karnataka	94	194	288	96	173	269	221
Kerala	326	82	408	333	72	405	—
Madhya Pradesh	443	654	1,097	574	662	1,236	455
Maharashtra	878	340	1,218	907	355	1,262	612
N.E.F. Region	18	78	96	21	67	88	—
Orissa	131	51	182	165	57	222	—
Punjab	1,284	771	2,055	1,353	1,670	3,023	1,491
Rajasthan	334	686	1,020	377	613	1,390	567
Tamil Nadu	337	439	776	323	441	834	557
Uttar Pradesh	864	1,214	2,078	928	1,524	2,452	678
West Bengal	647	736	1,383	694	716	1,410	505
Kandla	—	15	15	—	17	17	503
Total	**6,969**	**7,670**	**14,639**	**7,585**	**8,843**	**16,428**	**7,303**

C.A.P.—Cover and Plinth.

Source: Food Corporation of India, New Delhi.

Cited by Fertiliser Statistics, 1980-81; p. II.57

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APPENDIX - XXII

5.00. STORAGE CAPACITY

5.01. CENTRAL AND STATE WAREHOUSES AND THEIR CAPACITY
(as on 31.12.79)

State/Union Territory	No. of warehouses		Capacity ('000 tonnes)	
	Central	State	Central	State
Andhra Pradesh	32	48	671	209
Assam	3	22	27	80
Bihar	18	37	62	217
Gujarat	15	79	184	210
Haryana	13	65	109	412
Karnataka	10	50	84	154
Kerala	4	52	43	11[illegible]
Madhya Pradesh	19	149	174	413
Maharashtra	26	99	264	303
Orissa	9	34	59	62
Punjab	17	109	271	774
Rajasthan	4	72	73	288
Tamil Nadu	19	51	436	236
Uttar Pradesh	43	119	479	1,439
West Bengal	34	36	288	160
Meghalaya	Nil	1	Nil	2
Mizoram	1	Nil	Neg.	Nil
Nagaland	1	Nil	11	Nil
Tripura	1	Nil	7	Nil
Union Territories	9	Nil	66	Nil
Total	**278**	**1,023**	**3,308**	**5,074**

Source: Central Warehousing Corporation, New Delhi.
Cited by Fertiliser Statistics; 1980-81; p.II-56

APPENDIX -XXIII

II-58

5.03. STATEWISE COOPERATIVE GODOWNS

Sl. No.	Name of the State/U.Ts.	No. of godowns sanctioned upto 31-3-1981			No. of godowns completed upto 30-6-1981		
		Rural	Mktg.	Capacity (tonnes)	Rural	Mktg.	Capacity (tonnes)
1.	Andhra Pradesh	950	518	309,150	727	368	200,000
2.	Assam	748	219	225,350	307	179	106,420
3.	Bihar	1,511	388	273,800	764	284	146,950
4.	Gujarat	1,713	399	330,500	1,517	373	278,800
5.	Himachal Pradesh	929	120	122,850	615	95	82,310
6.	Haryana	1,394	341	545,100	751	329	463,700
7.	Jammu & Kashmir	135	57	30,900	—	5	4,000
8.	Karnataka	3,941	810	707,970	2,368	696	491,000
9.	Kerala	1500	117	186,487	1,083	85	129,800
10.	Madhya Pradesh	4,300	653	695,250	1,906	430	361,000
11.	Maharashtra	3,028	884	561,750	2,608	738	450,810
12.	Meghalaya	72	63	35,350	32	26	11,250
13.	Manipur	223	14	29,980	53	11	8,800
14.	Nagaland	10	7	5,250	10	6	3,750
15.	Orissa	1450	385	284,070	684	297	147,900
16.	Punjab	3,404	538	1,205,990	2,258	434	850,000
17.	Rajasthan	3,061	201	332,220	1,209	136	154,000
18.	Tamil Nadu	3,712	309	589,160	3,022	274	497,000
19.	Tripura	140	16	17,300	59	15	9,650
20.	Uttar Pradesh	6,949	232	886,900	3,909	245	583,000
21.	West Bengal	1,821	392	277,050	768	256	140,800
22.	Arunachal Pradesh	—	9	4,000	—	5	2,500
23.	Lakshadweep	10	11	14,050	8	—	120
24.	N.A.F.E.D.	—	2	8,550	—	2	8,550
	Total	41,001	6,685	7,678,977	24,658	5,289	5,131,610

Source: National Cooperative Development Corporation, New Delhi.

Cited by Fertiliser Statistics, 1980-81; p.II-58

APPENDIX - XXIV

Inventory carrying cost in respect of imported fertilisers - 1982-83

Inventories of imported fertilisers are mostly in the form of Urea and DAP. And the quantities in stock are usually in the ratio of 3 : 1.

Value of one tonne of Urea in stock	- Rs.2210/- (consumer price less dealer margin)
Value of one tonne of DAP in stock.	- Rs.3420/- (consumer price less dealer margin)
Average value of unit inventory.	- Rs.2512.50
Average level of inventory	- 1.5 million M.T.
Cost of interest in carrying 1.5 million M.T. at 19.5 percent per annum interest and value reckoned at Rs.2512.50/M.T.	Rs.73.5 crore
Cost of interest in carrying one tonne of inventory over twelve months.	Rs.490/-
Assuming that six months sales are held as inventories, cost of inventory carrying per tonne of fertiliser marketed.	Rs.245/-

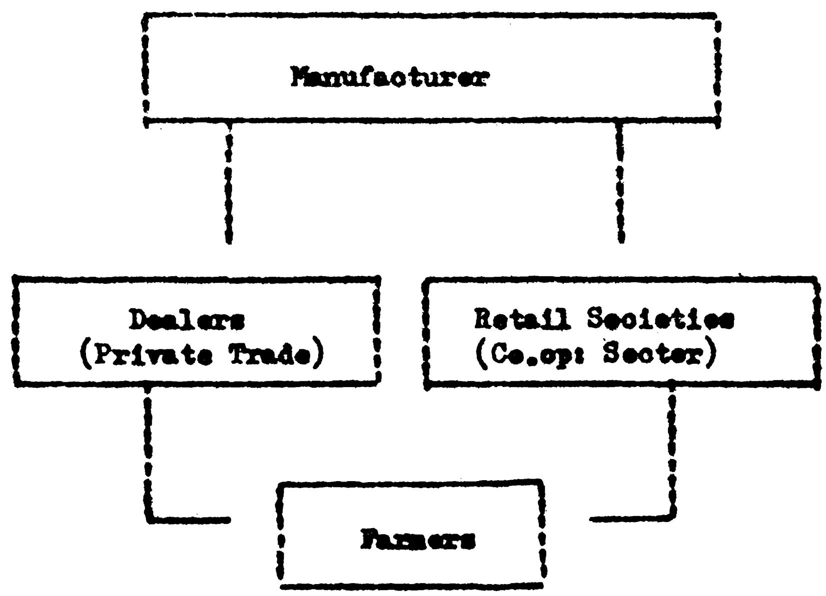
APPENDIX - XXV

Average value of fertiliser inventory during 1982 -'83

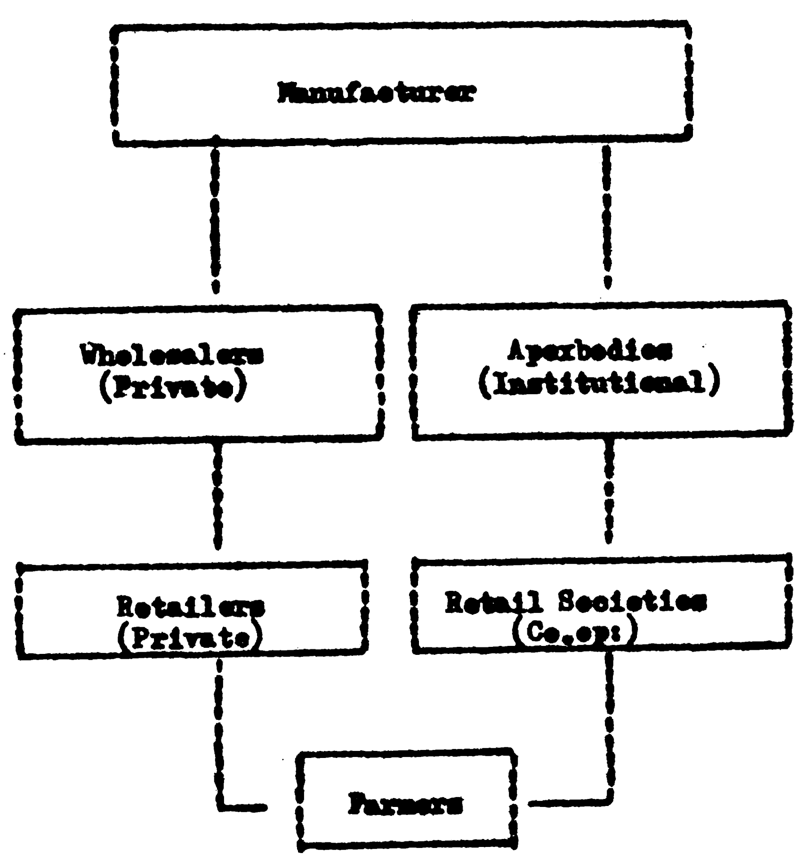
	Rupees per tonne
Value of unit inventory of imported nonpotassic fertilisers (as per appendix-xx)iv	2512.50
Value of unit inventory of potassic fertilisers (consumer price less dealer margin)	1220.00
Value of unit inventory of domestic fertilisers under retention prices (consumer price less dealer margin-weighted average.)	2450.00
Value of unit inventory of domestic fertilisers, outside the retention prices (consumer price less dealer margin - weighted average)	920.00
Weighted average value of all fertilisers.	2200.00

Distribution Channels - Single tier and Two tier Patterns

I. Single tier Pattern:



II. Two tier Pattern:



APPENDIX - XXVIII

Distribution margins paid in 1980 - 1981

I.	**Domestic fertilisers under retention prices**		
	Weighted average distribution margins.	-	Rs.128.30 per tonne
	Quantity distributed	-	6.35 million M.T.
	Total margins on these fertilisers.	-	Rs.81.47 crore.
II.	**Domestic fertilisers outside retention prices**		
	Weighted average distribution margin.	-	Rs.75/- per tonne
	Quantity distributed	-	1.89 million M.T.
	Total margin on these fertilisers.	-	Rs.14.17 crore
III.	**Potassic fertilisers**		
	Distribution margins	-	Rs. 80/- per tonne
	Quantity distributed	-	Rs.1.03 million M.T.
	Total margin on these fertilisers.	-	Rs. 8.24 crore
IV.	**Non potassic imported fertilisers**		
	Weighted average distribution margin	-	Rs.121/- per tonne
	Quantity distributed	-	3.56 million M.T.
	Total margin on these fertilisers	-	Rs43.08 crore.
	Grand total of distribution margins	-	Rs.146.96 crore
	Distribution margin per tonne	-	Rs.114.54

APPENDIX - XXIX

Distribution margins paid in 1982 - 1983

I.	Domestic fertilisers under retention prices		
	Weighted average distribution margins.	-	Rs.138.42 per tonne
	Quantity distributed	-	9.18 million M.
	Total margins on these fertilisers	-	Rs.125.56 crores
II.	Domestic fertilisers outside retention prices		
	Weighted average distribution margin.	-	Rs.75/- per tonne
	Quantity distributed	-	2.27 million M.T.
	Total margin on these fertilisers	-	Rs.17.03 crores
III.	Potassic fertilisers		
	Distribution margins	-	Rs.80/- per tonne
	Quantity distributed	-	1.10 million M.T.
	Total margin on these fertilisers	-	Rs.8.80 crore
IV.	Non potassic imported fertilisers		
	Weighted average distribution margin	-	Rs.146/- per tonne
	Quantity distributed	-	2.48 million M.T.
	Total margin on these fertilisers	-	Rs.36.21 crore
Grand total of distribution margins		-	Rs.188 crore
Distribution margin per tonne		-	Rs.125.75

APPENDIX - XXX

Distribution margins fixed by the Government with effect from 15-8-1981

Product	Distribution margins	
	Institutional Agencies	Private Parties
Urea	140	120
Diammonium Phosphate	165	145
Ammonium Sulphate	90	80
Calcium Ammonium Nitrate (25%N)	85	75
17:17:17	200	180
28:28:0	210	190
16:20:0	115	95
14:35:14	205	185
20:20:0 (APS)	190	170
20:20:0 (ANP)	140	120
15:15:15	140	120
14:28:14	190	170
24:24:0	230	210
10:26:26	165	145
12:32:16	165	145
19:19:19	120	100

Note: As per this notification, same distribution margins were fixed for a given product for all the domestic fertiliser firms.

Source: Government of India, ministry of agriculture, New Delhi, No 1-15/81-FA (P & C) dated 14th August, 1981.

mp.

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APPENDIX - XXXI

Revised distribution margins fixed by the Government for some products with effect from 13-11-'81

Product	DISTRIBUTION MARGINS	
	For Institutional Agencies	For Private Trade
16:20		
FACT	145	125
Parry	85	75
28:28		
CFL	235	215
FACT	180	160
Zuari	165	145
14:35:14		
CFL	235	215
Zuari	165	145
17:17:17		
MFL	205	185
FACT	155	135
19:19:19		
Zuari	145	125

Note: As per this notification, different distribution margins were fixed for the same product made and marketed by different firms.

Source: Government of India, Ministry of Agriculture, New Delhi. No 1-15/81 FA/P & C dated 13th November, 1981.

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APPENDIX - XXXII

Marketing costs in respect of imported fertilisers 1980 - 81

Item		Rupees per tonne
Transport cost: (Calculated by proportionate increase in the cost of transport of domestic fertilisers based on the relative leads)	-	180.00
Inventory carrying costs: (Average value of stocks of Urea and DAP, reckoned at Rs.2176.25 per tonne; interest reckoned at 18.33 percent; stock holding reckoned at six months level of sales)	-	199.43
Distribution margins: (Weighted average of Urea and DAP)	-	121.00
Other marketing costs: (same as incurred by domestic fertilisers under retention prices)	-	67.18
Total		567.61

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