CHAPTER I

INTRODUCTION

Importance of the Fertilizer Industry:

India is an agricultural country where about 80 percent of population live in rural areas and 72 percent depend on agriculture. Despite this, the production of foodgrains is hardly sufficient for country's requirements. Strangely enough, only about seven to eight percent of United States' population depend on agriculture, yet it has an exportable surplus exporting to many countries of the world. This indicates that agricultural has a great scope for improvement in India. A critical review of the performance of the agriculture sector in India in the past indicates that the overall rate of growth in agriculture was slow in relation to the growing needs of the population increasing at an alarming rate. This was because the early strategy of agriculture after independence was to rely heavily on an expansion of an area under different crops. Scope for this is now very limited because of the limited area of land available for crops. Therefore, the emphasis hereafter has to be on productivity improvement of the agricultural land through adoption of suitable
cropping patterns, use of high yielding varieties of seeds and application of massive doses of productive inputs, particularly fertilizers.

Fertilizers are to agriculture what steel is to industry. Fertilizers can be considered as the key to India's economic progress because agriculture sector accounts for more than 50 percent of the gross national product. Keeping in view the importance of the fertilizers, Government of India thought of producing chemical fertilizers within the country. A plan was prepared to set up a fertilizer plant at Sindri. The plant was commissioned in 1951. The launching of this unit was not only the start of the Indian fertilizer but was also the starting of the Indian public sector as well, for Sindri was the first industrial undertaking in the Government sector. But the Government of India accorded a high priority in the sixties to the development of the fertilizer industry. Soon after expansion took place and various units of the Fertilizer Corporation of India Limited at Mangal, Trombay, Gorakhpur, Namrup, Durgapur and Barauni, the plant of fertilizers and Chemicals Travancore Limited at Cochin, the plant of Madras
Fertilisers Limited at Manali, the Gujarat State Fertiliser Company's unit at Baroda and some other units at Kota, Kanpur, Vishakapatnam, Goa, Kalol, Rourkela and Neyveli came into being for the production of fertilizers in the country.

An obvious question to support the importance of the fertilizer can be asked as to how much of the food output comes from the application of fertilizers. To quote N.K. Nair, "A widely quoted estimate in the United States is that Chemical Fertilizers account for about 33 percent of crop production. The estimated contribution of fertilizers to grain production ranges from less than 10 percent for Thailand to over 50% for Japan with an average of 22 percent for a large number of countries in Asia and the Far East, including India and Pakistan". In spite of this much contribution of fertilizers, the developing world including India is still to go a long way to match the average fertilizer use of the developed countries. "As recently as 1975-76,

developing countries accounted for only 22 percent of the world fertilizer consumption, despite the fact that 70 percent of the world's population live in those countries. The developed countries, containing 30 percent of the world population, accounted for 77 percent of the fertilizer consumption and 87 percent of the fertilizer produced in 1976."

The Problem:

Fertilizer is not an end product, it is an intermediate product which is used for increasing agricultural production. The farmer's propensity to use fertilizers depends on the benefit/cost ratio that he gets with the use of fertilizers. Higher the benefit/cost ratio, the greater will be his efforts to use fertilizers and vice versa. There are two methods of making an improvement in this ratio. One is to raise the price of the produce of the farmer and the other is to reduce the price of fertilizers. In a country like India, where foodgrains account for a substantial part of the cost of living of the people, the scope for the first

method of increasing the price of the products of the farmer is limited. The second of reducing the price of fertilisers seems desirable because it enables the small farmers to use fertilisers at cheaper rate and increase production. From time to time, the selling prices of fertilisers have been substantially reduced by the Government of India by giving subsidy to the fertilizer industry. But still our prices of fertilizers are higher as compared to other advanced countries. Moreover, giving subsidy is not a lasting solution; the industry is to stand on its own legs. Better utilisation of the existing plant capacity of the fertilizer industry can go a long way in reducing the prices of fertilizers. Most of the fertilizer plants are not operating at full capacity. The over-all capacity utilisation of nitrogenous fertilizer industry during 1977-78 was about 65 percent and overall capacity utilisation of phosphatic fertilizer plants was about 66 percent as is clear from Table 1.1.

From Table 1.1, it is clear that in a country like ours, where resources are limited, prices of fertilisers are high and fertilizers
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<tr>
<td></td>
<td>Capacity Production</td>
<td>% Capacity Utilization</td>
<td>Capacity Production</td>
<td>% Capacity Utilization</td>
</tr>
<tr>
<td>Central Zone</td>
<td>500 415 83</td>
<td>500 412 82</td>
<td>148 50 34</td>
<td>148 43 29</td>
</tr>
<tr>
<td>East Zone</td>
<td>736 284 40</td>
<td>734 278 36</td>
<td>36 13 37</td>
<td>36 12 33</td>
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<tr>
<td>North Zone</td>
<td>258 58 25</td>
<td>80 80 100</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>South Zone</td>
<td>1037 635 61</td>
<td>1037 564 56</td>
<td>511 290 58</td>
<td>511 189 38</td>
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<tr>
<td>West Zone</td>
<td>714 608 95</td>
<td>714 528 75</td>
<td>347 317 91</td>
<td>347 233 67</td>
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<tr>
<td>All India</td>
<td>3221 2000 65</td>
<td>3065 1862 64</td>
<td>1042 570 66</td>
<td>1042 478 56</td>
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are in short supply, this utilisation of capacity is low. Keeping in view the capital intensive nature of the industry, under utilisation of capacity is still harmful. Efficient management of elements of working capital, like raw material which constitutes as high as 70 percent of the overall cost of production of fertilizers, can go a long way in keeping the cost of production at a low level. Thus, it is in country's interest to work the fertilizer plants at 100 percent capacity with the judicious use of working capital to reduce the reliance on imports of fertilizers and make available more fertilizers to the farmers at cheaper rate by reducing cost of production.

The domestic production falls short of demand, the deficit is met through imports of fertilizers as is clear from the following Table 1.2.

Table 1.2
Consumption, Production & Deficit of Nitrogenous & Phosphatic Fertilizers

<table>
<thead>
<tr>
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<th>Nitrogenous</th>
<th>Phosphatic</th>
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<tr>
<td>Total capacity</td>
<td>3,065</td>
<td>3,221</td>
</tr>
<tr>
<td>Consumption</td>
<td>2,457</td>
<td>2,915</td>
</tr>
<tr>
<td>Production</td>
<td>1,862</td>
<td>2,000</td>
</tr>
<tr>
<td>Deficit</td>
<td>595</td>
<td>915</td>
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The consumption of the fertilisers is within the capacity of the fertiliser industry, so reliance on imports can be totally eliminated if plants operate at 100 or near 100 percent capacity.

The problem of economic development in India is that of utilising more effectively the resources available to it. Capital is considered to be the most scarce production resource in India, so effective utilisation of its capital is an important aspect of its development policy. This helps in accelerating the rate of growth and in reducing the cost of production which in turn results in increasing the standard of living of the masses.

The total capital invested in industry of a country is divided into fixed capital and working capital. In making an analysis of the problem of capital formation in developing countries like India, main emphasis has been placed on the growth and allocation of fixed capital and the problem of judicious allocation of working capital has been generally overlooked. The present study is devoted to the management of working capital in the fertiliser industry in India. The object of this study is to analyse to
what extent the working capital is efficiently managed in the fertiliser industry.

**Scope of the Study:**

The study will be made of the units of the Central Government manufacturing fertilisers in India incorporated under the Companies Act, 1956. The study will be restricted to such units which are mainly engaged in the production of fertilisers. Such Central Government’s units which are composites, i.e. manufacturing mainly other items as steel along with fertilisers like Hindustan Steel Limited, Lignite Company, Neyveli etc. have been excluded because separate data for the production of fertilisers are not being published. Keeping in view these limitations, a study of the following four public sector units is feasible:

**Table 1.3**

<table>
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<tr>
<th>Name of Unit</th>
<th>Year of Incorporation</th>
<th>Year of Commencement of Production</th>
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<tbody>
<tr>
<td>1. Fertilisers and Chemicals Travancore Ltd. (FACT)</td>
<td>1943-44</td>
<td>1946-47</td>
</tr>
<tr>
<td>2. Fertiliser Corporation of India Ltd. (FCI)</td>
<td>1960-61</td>
<td>1960-61</td>
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The present study will cover a period of 10 years from 1968-69 to 1977-78 except in case of Madras Fertilizers Ltd. where the study is restricted to a period of 7 years from 1971-72 to 1977-78 because this concern started production in 1971-72. National Fertilizers Ltd. started production in 1978-79, so it does not fall in the period selected for the study. Thus this unit has been excluded and the study is restricted to the management of working capital of the first three units mentioned above, namely, FACT, FCI and MPL. A brief review of these units is given below:

3.1 The Fertilizers and Chemicals Travancore Limited (FACT)

The Fertilizers and Chemicals Travancore Limited was the pioneer in the large scale manufacture of Chemical Fertilizers in the country. This Company was the brain child of Dr. C. P. Ramaswamy Iyer, Dewan of Travancore. The Company was incorporated in 1943, during the days of acute food shortage. A 44,000 tonne ammonium sulphate plant went into commercial production in 1947 at Eloor, Udyogamandal. The then Government of Travancore State was a substantial share-holders in the venture. Government of India became a major shareholder in
1963. A major contribution made by this organisation in the industrial development in India is that it helped in the development of indigenous technical know-how.

To meet the growing fertiliser requirements of Kerala, Tamil Nadu and other States in South India, FACT has organised a well-knit distribution system. For encouraging the use of balanced fertilizers, it is doing intensive field publicity and extension work. In addition to the straight fertilizers like ammonium sulphate and superphosphate, it is also producing complex fertilizers for a variety of crops to suit the different soil conditions in the southern states and other valuable chemicals.

Expansion Programme:

The plant at Udyogamandal was expanded from time to time. The expansion took place in the undermentioned four stages:

First Stage: In 1959, the sulphur dioxide plant with a capacity of 40 tonnes a day was taken in hand and was commissioned in August, 1960.

Second Stage: The Company took in hand the second stage of expansion to increase the production of ammonium sulphate by another 40 tonnes per day and placed orders for the oil gassification plant to
replace the existing firework gasification and allied unit. The second stage of expansion was completed in 1962 and raised the production capacity of the Company in terms of nitrogen from 20,000 tonnes to 30,000 tonnes per annum.

**Third Stage:** The third stage of expansion was completed in October, 1966 and increased the production capacity to 70,000 tonnes of nitrogen per annum.

**Fourth Stage:** The critical power position compelled the Company to consider reorganisation of its plants, so that the total power requirements could be substantially reduced. Keeping in view this, a fourth stage expansion was formulated in 1965-66 which sought to replace the electrolytic hydrogen plant by modern naphtha steam reforming plant reducing the power requirements from 50,000 KW to 30,000 K.W., increase of ammonia production from 260 tonnes to 340 tonnes per day and establishment of a phosphoric acid concentration plant for manufacturing ammonia phosphate at the rate of 1,81,000 tonnes per annum. The fourth stage was completed in October, 1971.

**Cochin Project-Phase II:** In addition to the expansion made at the Udyogamandal unit, the Company has set up a new Rs.73 crore urea plant at Cochin close to the Cochin Refinery. It was designed to produce 600 tonnes of liquid ammonia and 1,000 tonnes of urea per day.
using naphtha as feedstock. The plant started production in 1973.

Cochin Project—Phase II: After the completion of the first phase, the second phase was taken on hand. Under this project referred to as Phase II, it was designed to establish 1,000 tonnes per day sulphuric acid plant, 360 tonnes per day phosphoric acid plant and 1600 tonnes per day NPK plant. The sulphuric acid plant went into commercial production on 2nd December, 1976. This was followed by the commissioning of the phosphoric acid plant by the middle of December, 1976. The NPK plant went into production in January, 1977.

FACT Engineering and Design Organisation (FEODO): The Company has a separate engineering and design organisation known as FEODO. It has been set up to provide expertise in planning, designing, erecting and commissioning fertilizer plants. In 1969-70, it took up a new branch of activity in Market survey and preparation of feasibility studies.

FACT Engineering Works (FEW): The Company has a separate division known as FACT Engineering Works (FEW). It undertakes structural and erection work at sites. This division is well equipped with modern machinery and tools and is manned by experienced engineers.
3.2 The Fertiliser Corporation of India Limited (FCI)

The Fertiliser Corporation of India Limited came into existence on 1st January, 1961, with the amalgamation of the then two public sector fertiliser units at Sindri and Nangal. It had seven operating units—Sindri (Bihar), Nangal (Punjab), Trombay (Maharashtra), Gorakhpur (U.P.), Numrup (Assam), Durgapur (West Bengal) and Barauni (Bihar) and four new grassroots projects under implementation—Korba (Madhya Pradesh), Talcher (Orissa), Haldia (West Bengal), and Ramagundam (Andhra Pradesh) on 31st March 1978. Since then re-organisation of the Company took place which has been explained in this section after the discussion of the various units of the Company.

The Fertiliser Corporation of India Limited has played a major role in the production of fertilisers in the country. It is one of the largest fertiliser manufacturing companies in the world. The installed capacity of FCI’s units had spiralled to nearly one million tonnes in terms of nitrogen as against 1,60,000 tonnes at the time of its formation in January 1961.

A full-fledged Planning and Development Division of the Corporation was set up at Sindri in 1951. It is a comprehensive multifunctional division
covering the activities of research and development, process design, engineering, installation and commissioning of plants. Several commercial plants have been set up because of its research and development activities.

A brief description of seven operating units and four projects under implementation is given below:

Sindri: Sindri was the first major industrial unit of the Government of India. It was started in 1951 to manufacture the much needed fertilisers for food production. It produces urea, ammonium sulphate and ammonium sulphate nitrate by using gypsum as raw material. The rationalisation project, designed to improve the efficiency of the new ageing plant, is complete and will produce 3,26,000 tonnes of triple superphosphate.

Nangal: Nangal Fertiliser plant was commissioned in April, 1961. It is the second large factory set up by the Government of India. This unit has the distinction of being the only factory in South East Asia producing heavy water, and the first in India to have started the production of calcium ammonium nitrate. The Nangal expansion plant, based on fuel-oil, has an installed capacity to produce 3,30,000 tonnes of urea per annum.

Trombay: Trombay Unit went into production in
November, 1965 and produces a complex fertilizer under the brand name 'Saphala'. Trombay-IV Expansion will produce 3,61,000 tonnes of ammonium nitrate phosphatic annually.

**Gorakhpur:** Gorakhpur fertilizer factory, based on naphtha, started commercial production in January, 1969. The Expansion Project which increased the plant capacity to 1,31,000 tonnes in terms of nitrogen was commissioned in April, 1976.

**Namrup:** It is the first fertilizer factory in India to use natural gas as feed stock. It started commercial production in January, 1961. It is also the first plant in the country to use indigenous catalysts developed by the Planning and Development Division of the Organisation. The Namrup Expansion Project started production in October, 1976. It has a capacity to produce 3,30,000 tonnes of urea per annum.

**Durgapur:** The fertilizer plant at Durgapur was put on commercial run in October, 1974. It has a capacity to produce 3,30,000 tonnes of urea per annum.

**Barasat:** This factory was wholly designed and engineered by the Fertilizer Corporation of India's Planning and Development Division. It is
naphtha based factory which went into commercial production in November, 1976. It has an installed capacity to produce 3,30,000 tonnes of urea per annum.

**Talcher, Ramagundum and Korba:**

The world's largest coal-based fertilizer projects at Talcher, Ramagundum and Korba are a pioneering effort of the Fertilizer Corporation of India Limited in making use of indigenously available coal for production of fertilizers. Each of these plants will have a capacity to produce 4,95,000 tonnes of urea annually.

**Haldia:** The plant at Haldia is designed to produce 1,65,000 tonnes of urea and 5,00,000 tonnes of NPK (15:15:15) per annum.

To have effective management and greater autonomy for the plants leading to improved efficiency and the increased production, Government of India re-organised the Fertilizer Corporation of India Limited and the National Fertilizers Limited with effect from 1st April, 1978 as follows:

- **(A) Fertiliser Corporation of India Limited.** Comprising Sindri Unit, Gorakhpur Unit, Ramagundum, Talcher and Korba Projects.
- **(B) National Fertilizers Limited.** Bhatinda, Panipat and Mangal Unit of PCI.
- **(C) Hashtrvia Chemicals & Fertilizers Limited.** Trombay and New Fertiliser Plants at Thal, Vaishet.
Our study is restricted to pre-organised PCI because re-organisation took place on 1st April, 1978 which does not fall within the period (i.e. 1st April 1966 to 31st March, 1978) of the present study.

3.3 Madras Fertilisers Limited (MFL)

Madras Fertilisers Limited was established on the basis of a formation agreement signed by the Government of India and Amoco India Incorporated, U.S.A. and was incorporated on December 8, 1966. Another partner, National Iranian Oil Company, Iran joined the Company from October 22, 1973. The equity participation is 51% Government of India, 24 1/2% Amoco India incorporated and 24 1/2% National Iranian Oil Company. The Company has established a fertilizer plant at Manali near Madras and started commercial production on November, 1, 1971.

The Company signed a contract on March 22, 1974 with Messrs Dorr-Oliver India Ltd. for construction and commissioning of an additional NPK train, similar to the existing two trains. With this additional NPK train in operation, the production capacity of the Company of NPK was increased by 1,81,500 tonnes per annum. This plant was successfully
completed in April, 1976 well ahead of schedule.

On 31st March, 1978, the Company had an installed capacity of 2,47,500 tonnes of ammonia, 292,000 tonnes of urea and 5,40,000 tonnes of NPK Fertilisers. Two of the major raw materials for NPK manufacture viz. phosphoric acid and potash are imported. The marketable products of the Company are urea and four grades of NPK fertilisers viz., 17-17-17, 14-28-14, 24-24-0 and 18-46-0. Marketed through Co-operatives and private dealers, MPL products reach the farmers of Tamil Nadu, Andhra Pradesh, Karnataka, Kerala, Union Territory of Pondicherry, Maharashtra, Madhya Pradesh, Orissa, Punjab and Haryana.

Overall performance of the Company has been satisfactory. Within three years of commencement of commercial production, it gained the distinction of being a well-managed, productive, profitable and service-oriented public sector company.

4. The purpose of the Study:

The study is concerned with the problem of how best to manage the working capital in the selected fertilizer units. The specific objectives being:

(1) the study of the practices of management of working capital in the selected fertilizer units;
(2) the examination of the methods of financing of working capital in the selected units; and
(3) to suggest ways and means for the effective utilisation of the working capital.

5. **Research Methodology:** In conducting this study, annual accounts and reports of Directors of the units under study have been examined and analysed. Further data have been collected by issuing questionnaire to the financial managers of the units concerned followed by personal interviews with them to elicit clarification and elucidation of points that arose on the analysis of published material. The data have been analysed with a view to arriving at conclusions relating to the management of working capital in the fertilizer industry in the public sector. A large part of the research effort involved field studies of the selected fertilizer units and interviews of business executives. An effort has been made to learn from the business executives how they perceive the problem of management of working capital and how they deal with it.

6. **Plan of the Study:**

The study has been divided into seven chapters including the present one. The second chapter gives a description of the conceptual framework of working
capital. The third, fourth and fifth chapters deal with the management of the three important components of working capital, namely, inventory, receivables and cash respectively. An analysis of the various sources of getting working capital in the selected fertilizer units has been made in the sixth chapter. The seventh and final chapter summarizes the findings of the present study and offers a few suggestions for making improvements in working capital management in the selected fertilizer units.

7. **Summary and Conclusion:**

Fertilizers are to agriculture what steel is to industry. Fertilizers can be taken as the key to India's economic progress because 72 percent population in India depend on agriculture. Fertilizer is not an end product, it is an intermediate product which is used for increasing the productivity of land. The farmer's capacity to use fertilizers is dependent on the benefit/cost ratio that he gets with the use of fertilizers. Higher the benefit/cost ratio, the greater will be the application of fertilizers and vice-versa. This ratio can be improved by reducing the prices of fertilizers. From time to time, the selling prices of fertilizers have been substantially
reduced by the Government of India by giving subsidy to the fertilizer industry so that even small farmers may be able to use fertilizers at a cheaper rate and increase the production. Giving subsidy is not a lasting solution; the industry is to stand on its own legs. Better utilisation of the existing plant capacity of the fertilizer industry and efficient management of elements of working capital can go a long way in reducing the cost of production.

The total capital invested in industry is divided into fixed capital and working capital. In the past main emphasis was placed on the growth and efficient management of fixed capital and the problem of efficient management of working capital was generally overlooked. Keeping in view this, the present study is devoted to the management of working capital of the units of the Central Government manufacturing mainly fertilizers in India incorporated under the Companies Act, 1956. The period covered in the present study is 10 years from 1968-69 to 1977-78. The study will be restricted to three units, namely, the Fertilizers and Chemicals Travancore Ltd. (FACT), the Fertilizer Corporation of India Ltd. (FCI) and Madras Fertilizers Ltd. (MFL). Another Central Government unit, namely, National Fertilizers Ltd. (NFL) has been excluded from the
present study because it started production after the period selected for the study.