CHAPTER I
INTRODUCTION
1.1 Introduction

Agriculture accounts for nearly 20 per cent of India's GDP and more importantly, more than 60 per cent of the country's population is dependent on agriculture and allied activities for their livelihood. This reality compelled Mahathma to emphasize that India lived in her villages. Huge population made food security a national imperative. The five year plans during earlier periods have stressed on self-sufficiency and self-reliance in food grains production and concerted efforts in this direction have resulted in substantial increase in food grain production and productivity. This is evident from the fact that from a very modest level of 52 million tonnes in 1951-52, food grain production rose to more than 206 million tonnes in 1999-2000. Behind India's success story of not only meeting total requirement of food grains but also having exportable surplus lays the significant role played by chemical fertilizers.

Chemical fertilizers have played a vital role in the success of India's green revolution along with irrigation and credit and extension services provided by the Government. The increase in fertilizer consumption has contributed significantly to sustainable production of food grains in the country. The Government of India has been consistently pursuing policies conducive to increased availability and consumption of fertilizers in the country. The production of Nitrogen (N) and Phosphorus (P) fertilizer together has increased from mere 0.3 lakh MT in 1950-51 to about 251 lakh MT in nutrients terms in 2006-07. Since there are no commercially viable sources of Potash (K) in the country, its entire requirement is met through imports. The overall consumption of fertilizers in nutrient terms (N, P & K) currently is about 18.115 million MT per annum. The consumption of N, P₂O₅ and K₂O is 11.64, 4.47 and 1.99 million tonnes respectively.

As of now, the country has achieved near self-sufficiency in production capacity of urea and DAP, with the result that India could
manage its requirement of these fertilizers from indigenous industry and imports of all fertilizers except MOP have presently been nominal.

Fertilizer, being a major source of plant nutrient is one of the most essential agro-input required for enhancing farm production. It is estimated that fertilizer contributes about 50 to 60 per cent to incremental agriculture production.

Indian farmers used 338 thousand tonnes of NPK in 1960-61, in 1970-71 about 6.7 times as much was used. The nutrient used in 1980-81, 1990-91 and 1998-99 was 16.3, 37.1 and 49.5 times more as compared to 1960-61. In 2003/04, total nutrient consumption was 16.8 million tonnes. This increases in the nutrients applied to crops have been essential to support the agricultural evolution which began in India during mid sixties after the introduction of High Yielding Varieties (HYV) and development of irrigation infrastructure.

The desired level of NPK for the Indian soils is 4:2:1. Prior to the decontrol of P and K segments of fertilizer industry during 1992 the NPK usage was close to the 4:2:1 level. However subsequent to partial decontrol the prices of P and K fertilizers increased owing to the import component and as a result the NPK consumption ratio soared to 9.7:2.9:1 in 1993. The government had to initiate a series of adhoc measures to achieving the parity among the price of N in relation to that of P and K and as result the ratio has come down to 7.9:2.9:1 in the year 1997-98.

The seventies and eighties witnessed a significant addition to the fertilizer production capacity. The installed capacity as on 30.01.2003 reached a level of 121.10 lakh MT making India the third largest fertilizer producer in the world. Even though India is the third largest fertilizer user, average rate of nutrient application is 88.3kg per hectare[2003-04], which is very low as compared to that of Pakistan (116 kg/ha), Sri Lanka (106 kg/ha) and Bangladesh (137 kg/ha). The consumption is highly concentrated in certain areas and large areas receive very little fertilizer.
1.2 Problem Definition

Consequent upon green revolution, fertilizer consumption is growing in the country. Presently Karnataka State occupies 10th place in fertilizer consumption in the country. In 2003-04, the average per hectare consumption was 78.8 kgs per hectare. Fertilizer consumption is a function of crop type, farmer’s behaviour and prices of that particular commodity.

Fertilizer is a major input to increase crop output. It is required to meet the increasing demand for food grain and also to increase the incomes of farmers. Fertilizer industry is Oligopolistic in nature. A few large firms in public, co-operative and private sectors are responsible for production of fertilizer.

Agriculture production in Karnataka has remained stagnant since 1990 and this can only be broken through adoption of modern technology in agriculture and increasing usage of chemical fertilizers.

Therefore, a systematic research on “Fertilizer Market in Karnataka: A Micro Level Study of Components and Influencing Variables” is undertaken with the following objectives:

1.3 Objectives of the Study

The objectives of the research are:

1. To identify the important players in the fertilizer market in Karnataka.
2. To assess the fertilizer purchase behavior of the farmers
3. To analyze the fertilizer usage behavior of the farmers
4. To evaluate the efficiency of marketing channels
5. To examine the promotional activities adopted by manufacturers
6. To suggest measures for improvements in the existing system of fertilizer distribution
1.4 Scope of the Study

The study deals with fertilizer market in Karnataka State. This is an attempt to describe the elements of fertilizer market namely the buyers (farmers), the marketers (manufacturers and channel members) and the Government, which is an important intermediary in fertilizer market. Government has a responsibility to regulate the fertilizer market so that farmers are assured of adequate supply of fertilizer at reasonable prices and also not subjected to vagaries of the market.

1.5 Research Methodology

The research design employed for this study is of descriptive type. The study aims to explore the dimensions of fertilizer marketing in Karnataka

1.5.1 Sampling Design

The sample unit consists of three categories of markets:

- High fertilizer consumption districts; (Bangalore, Shimoga, Davanagere and Raichur – consumption of fertilizer > 125 kgs per hectare.

- Medium fertilizer consumption districts; (Mysore, Belgaum, Kolar and Hassan – consumption of fertilizer > 100 kgs but < 125 Kgs per hectare)

- Low fertilizer consumption districts; (Dharwad, Tumkur, Bijapur and Gulbarga – consumption of fertilizer < 100 Kgs)

(Refer table 1.1)
Table 1.1.

District wise Consumption of Fertilizer in Karnataka

<table>
<thead>
<tr>
<th>District</th>
<th>Fertilizer Consumption (kgs per ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangalore rural</td>
<td>455.4</td>
</tr>
<tr>
<td>Kodagu</td>
<td>191.8</td>
</tr>
<tr>
<td>Shimoga</td>
<td>184.6</td>
</tr>
<tr>
<td>Mandya</td>
<td>173.0</td>
</tr>
<tr>
<td>Davanagere</td>
<td>163.5</td>
</tr>
<tr>
<td>Bellary</td>
<td>156.1</td>
</tr>
<tr>
<td>Chickmagalur</td>
<td>132.3</td>
</tr>
<tr>
<td><strong>Raichur</strong></td>
<td><strong>131.6</strong></td>
</tr>
<tr>
<td>Hassan</td>
<td>123.9</td>
</tr>
<tr>
<td>Kolar</td>
<td>123.0</td>
</tr>
<tr>
<td>Belgaum</td>
<td>115.0</td>
</tr>
<tr>
<td><strong>Mysore</strong></td>
<td><strong>105.0</strong></td>
</tr>
<tr>
<td>Koppal</td>
<td>99.5</td>
</tr>
<tr>
<td>Bangalore Urban</td>
<td>92.5</td>
</tr>
<tr>
<td>Bagalkote</td>
<td>92.1</td>
</tr>
<tr>
<td>Dakshina kannada</td>
<td>84.9</td>
</tr>
<tr>
<td>Haveri</td>
<td>79.4</td>
</tr>
<tr>
<td>Chamarajnagar</td>
<td>78.9</td>
</tr>
<tr>
<td>Dharwar</td>
<td>59.0</td>
</tr>
<tr>
<td>Uttar Kannada</td>
<td>58.5</td>
</tr>
<tr>
<td><strong>Tumkur</strong></td>
<td><strong>55.1</strong></td>
</tr>
<tr>
<td>Chitradurga</td>
<td>51.0</td>
</tr>
<tr>
<td>Gulbarga</td>
<td>45.9</td>
</tr>
<tr>
<td>Udupi</td>
<td>44.9</td>
</tr>
<tr>
<td>Bijapur</td>
<td>43.9</td>
</tr>
<tr>
<td>Bidar</td>
<td>42.7</td>
</tr>
<tr>
<td>Gadag</td>
<td>39.3</td>
</tr>
</tbody>
</table>

Source: Fert & Agri. Statistics. FAI Karnataka; www.ppi-ppic.org
Figure: 1.1
District wise Fertilizer Consumption in Karnataka (Kgs per hectare)
Figure: 1.2
Representation of Villages Selected for the Survey in Mysore
Figure: 1.3
Representation of Villages Selected for the Survey in Tumkur
Figure: 1.4
Representation of Villages Selected for the Survey in Raichur
In order to ensure a fair comparison, districts having plantation crops, which have a different consumption pattern, were not considered for the study. Based on judgment the following districts were taken up as sampling units: (fig 1.3, 1.4, 1.5)

1) Raichur – High Consumption District

2) Mysore – Medium Consumption District

3) Tumkur – Low Consumption District

In each of the district, ten villages were selected using random numbers. From each of these ten villages using snowball sampling technique 15 farmers were selected. Thus, the total size of sample from the three districts comprising of 10 villages is 10 x 15 x 3 = 450 farmers. Open ended questionnaires were administered to this 450 sample units. Personal interview was also conducted wherever necessary. (The list of villages is given in Appendix-1).

As regards the marketing network for fertilizers, there are 11039 sales points operating in Karnataka in 2004-05. These were:

(1) Village level cooperative, which get supplies from the State Marketing Federation; and

(2) Private dealers who obtained supplies from manufactures and /or marketers.

From the selected 3 districts, a total of 60 traders, 20 each from selected districts were selected for the interview, these fertilizer outlets included Cooperatives, Retail traders, Wholesalers and Wholesalers cum retailers which were very famous among the farmers of the study area.

Snowball sampling (in this snow sampling one progressive farmer / village cooperative secretary was interviewed and was asked to refer two or more progressive farmers in the village and the procedure is repeated) was adopted in selection of the sample farmers in the selected villages.
Selection of villages and selection of farmers in these villages formed the two stages of the sampling. Based on census data i.e. total population data at village level the villages were selected using random tables. Considering the large population of farmers in each selected district freedom of choice was available in case of non-availability of particular respondent.

From the sample farmer’s information was collected on the following subjects through a structured questionnaire and personal interview. The questionnaire used for interviewing farmers is given in Appendix II:

(1) Land holding
(2) Cropping pattern
(3) Fertilizer usage
(4) Quantity and pattern of fertilizer purchases
(5) Technical knowledge about fertilizer usage
(6) Sources of information on agriculture and farming practices
(7) Motives for nonuse, high or low use of fertilizer
(8) Brand and dealer preference
(9) Preference for different fertilizer attributes
(10) Barriers to supply of fertilizers

The study proposed to survey the efficiency of the different marketing channels through their ability to serve the farmers. The farmers’ opinion was taken to be an index of the performance or the ability of the sale point to meet the requirements of its consumers efficiently. The farmers were asked to assign reasons for preference for specific sale points and identify the difficulties in supply of fertilizers. This information was also collected from the respondents on the above questionnaire. Survey of selected retail outlets was also undertaken to
understand the working of outlets, credit extended and problems faced by outlets. This pertained to the study period April 2005 to March 2006.

Opinion on the promotion agencies engaged in fertilizer promotion was also obtained from the sample farmers. The questionnaire used for interviewing fertilizer traders is given in Appendix III.

As a study of perception of farmers on fertilizer usage and purchase preference, the questions pertained to opinions on fertilizer role and requirements in efficient farming. The cropping and fertilizer usage pattern followed by farmers in each of the selected districts was abridged to obtain the district averages. The area under different crops was compared with the fertilization. Fertilizer application in each crop was also compared with the standards prescribed by experts. Variations in usage from the standard were analyzed.

Comparisons of the cropping pattern and fertilizer application among different farm size categories was also undertaken. The cropping intensity and percentage of gross cropped area fertilized were also compared across the three categories in each of the selected districts.

Average consumption in village level categories, that is 15 sample farmers formed one category, was also compared across the districts. This was done to see if there were significant variations in consumption levels across geographical area within the same districts. This would also reflect the importance of size specification and difference in fertilization and farming practices within different farming tracts.

While comparing farm size, cash/credit and village level categories besides consumptions per acre of gross cropped area, the study also compared consumption per acre of operational holding and consumption per fertilized acre. The former was done to compensate for variation in cropping intensity and the later to compare the rates of applications in fertilized crops across different categories. It was assumed that variation in different categories formed would be uniform across categories.
Comparisons of the same were not undertaken due to the large number of categories involved.

During the preliminary collection of data on the reasons for non-adoption of recommended doses of fertilizers, it was observed that a large number of sample farmers either did not know the recommended doses for individual crops or weren’t inclined to adopt recommended doses. The questions were widened to include reasons for not using higher doses of fertilization. However, even then a high proportion of respondents could identify only limited constraints for higher fertilizer usage.

The responses were collected and presented in tabular form. Weights were assigned to responses: The responses were collected in the following two formats; very important, important, no opinion / can’t say, not important and not at all important and strongly agree, can’t say / no opinion, disagree, strongly disagree.

The responses were converted into the above scales and mean scores were compared.

1.5.2 Sources of Data

For the purpose of the research study, both the primary and secondary data has been collected.

1.5.2.1 Primary Data

Primary data regarding the purchase and usage of fertilizers, factors influencing fertilizer usage, fertilizer technical knowledge and the problems encountered by distributors and farmers, and farmer’s preference for different fertilizers was collected by questionnaire and personal interviews with retailers and farmers.
Fertilizer Selling Agencies:

i. Public Sector Agencies: Eg: Karnataka Agro Industries Corporation (KAIC)

ii. Co-operatives: Eg: Karnataka State Co-operative Marketing Federation (MARKFED)

iii. Government: Eg: Department of Agriculture, Government of Karnataka

iv. Private traders:

1.5.2.2 Secondary Data

The data regarding brand wise marketing of nitrogenous, phosphatic and potassic fertilizers was collected from the office of Director of Agriculture, Bangalore. The data regarding agency-wise fertilizers sold and the distribution of retail outlets were also collected from the office of Director of Agriculture, Bangalore.

The following different brands of chemical fertilizers marketed in district were considered for analysis in this study as these brands were considered popular in the study area.

- Southern petrochemicals industries corporation (SPIC)
- Mangalore Chemicals Limited (MCF)
- Zuari Agro Chemicals Limited (ZACL)
- Fertilizers and Chemicals Travancore (FACT)
- Rashtriya Chemicals and Fertilizers (RCF)
- Krishika Bharath Co-operative (KRIBHCO)
- Madras Fertilizer Limited (MFL)
- Indian Farmers Fertilizers Co-operative (IFFCO)
- Indian Potash Limited (IPL)
- EID Parry (EIDP)
- Gujarat State Fertilizers Company (GSFC)
The data collected from farmers and traders of the study area is classified, analyzed and tabulated in a systematic manner using various statistical techniques such as average, percentage, graphs, diagrams, correlation and regression analysis has been employed depending upon the requirements.

1.6 Limitations of the Study

Primary data plays a crucial role in this study. Since primary data is collected through questionnaires and interviews, there is likelihood of in-accuracies, which may lead to illicit or fallacious generalizations. As the sample size is small and it may not accurately represent the universe, hence the conclusions may be biased. The data collected pertains to April 2005 to March 2006.