CHAPTER 8
CONCLUSIONS, FINDINGS AND SUGGESTIONS
Genius is the ability to reduce the complicated to the simple.

- C W Ceram.

All truths are easy to understand once they are discovered.
The point is to discover them.

- Galileo Galilei

Not every thing that can be counted counts and not every thing that counts can be counted.

- Albert Einstein.
Chapter – 8

FINDINGS AND CONCLUSIONS

Indian Phosphatic fertiliser industry's genesis can be traced to the year 1906, when M/s EID Parry Ltd., commenced production of Single Super Phosphate in it's plant at Ranipet, Tamilnadu. This sector remained dormant, till 1950s, as Indian agriculture at that time by far and large used traditional methods of production and there was little awareness of the role of fertilisers in increasing land productivity. The articulation of new agricultural strategy with more emphasis on usage of High Yielding Variety seeds, brought into light the role of fertilisers as an essential input for the growth in agricultural productivity. So, the conception of Fertiliser industry in India was visualised in the context of nutrient needs of the Indian agriculture.

This philosophy gained momentum in the green revolution era, and Government of India had to articulate fertiliser pricing strategy to make it available at affordable rates, for achieving self sufficiency in food grains production. In the absence of indigenous production capacity for major nitrogenous and Phosphatic fertilisers, the country relied totally on imports during those days, but the lack infrastructure and a structured mechanism for distribution of these imported fertilisers to various parts of the country, the consumption in most places remained very low. The recommendations of the Sivaraman committee set up by the Government in 1965, essentially focussed on the smooth distribution of fertilisers, after which the Government introduced the Pool fertiliser scheme, under which the fertilisers imported at any Indian port would be part of the pool fertiliser scheme, under which the Government would allocate the market for the product and reimburse the freight on equated basis, in the form of subsidy. This scheme helped significantly in improving the availability of fertilisers in all parts of the country and also in growth of the consumption.
Subsequently the oil crisis of 1973 and severe constrains on the foreign exchange front, gave impetus to the need to create a domestic industry for production of fertilisers. By that time, some major fertiliser plants were created in India such as GSFC Ltd., Coromandal Fertilisers Ltd., FACT Ltd., which introduced prime Phosphatic fertilisers such as Di-Ammonium Phosphate and other complex grades. To stimulate the growth of indigenous industry, Government of India introduced the Retention price scheme (RPS) in 1977 for nitrogenous fertilisers and in 1979 for phosphatic fertilisers, pursuant to the recommendations of Marathe Committee.

The objective of the scheme primarily was to create a conducive atmosphere for the entrepreneurs, with guaranteed return and more particularly the RPS was fixed on unit wise basis and the manufacturers is relieved of competing with others on the cost front. This facilitated substantial investment into the industry and the production of Phosphatic fertilisers increased remarkably. The foremost advantage for fertiliser industry during this period was the demand, which increased consistently as the Government rarely changed the retail price of fertilisers in over a decade.

The fiscal crisis in the early 1990s and the necessity of reducing the strain on exchequer, the Government formed a Joint parliamentary committee in 1991, and based on it’s recommendations decontrolled Phosphatic fertiliser industry w.e.f. 25th August, 1992, thereby withdrawing subsidy and other movement restrictions on Phosphatic fertilisers. This lead to steep increase in prices of these fertilisers and the continuance of nitrogenous fertilisers under price subsidy scheme, resulted in remarkable fall in consumption of Phosphatic fertilisers. The price bias, caused over consumption of nitrogen based fertilisers leading to imbalance in consumption ratio. This necessitated reintroduction of adhoc subsidy by the Government on DAP at Rs. 1000 a ton, for keeping the prices stable.

Though the domestic industry was adversely affected by the dumping of imported fertilisers at lower prices, the prime cause for the financial adversity of the industry was the introduction of unified exchange rate mechanism in March, 1993, due to
which the industry was compelled to buy US Dollars at the market determined rates and the continuous fall of Rupee pushed the production costs beyond reasonable levels. The fall in demand due price hike and the escalation in cost of production, left the industry in severe financial mess and most of the manufacturing units incurred substantial losses during that period. The Government had to accede to the demands of the industry to hike subsidy, and in 1996 the subsidy on DAP was increased to Rs. 3000 a ton. However, there was no mechanism for evaluating the production costs for fixing subsidy for compensating the industry for cost escalations.

Price subsidisation once again surfaced as a prominent issue and to establish a proper methodology for fixation of rate of concession on various phosphatic fertilisers, the Government appointed the Tariff Commission, Ministry of Commerce (Previously Bureau of Industrial Cost And Prices) to carry out a study on production costs of various Phosphatic fertiliser units and lay a methodology for notifying the periodical subsidy rates, so that the escalations in costs would be factored in for compensating the industry. The commission submitted reports for DAP and Complex fertilisers which have been implemented from 1999-2000 and 2002-03 respectively. Expenditure Reforms Commission has advised the Government to further refine the scheme for DAP, which it felt has bestowed un-intended benefit to manufacturing units which use captive raw materials. The contents of the report have been discussed in the earlier part of the current study. The current concession scheme evaluates cost based on industry averages, unlike under RPS which was done for each unit.

The woes of the domestic Phosphatic fertiliser industry continue to exist, even now. The realisation available to the unit in the form of retail price and subsidy is grossly inadequate, resulting in under absorption of cost. The financial performance of Phosphatic fertiliser industry during the last three years has been adverse, one of the factors being anomalous subsidy mechanism, which does not recognise genuine costs incurred by the units and also cost escalation, adequately. The efficiencies normated in the cost structure for determination of production cost, is rigid and would be difficult to achieve by all the units. The objective of these norms certainly is to prune
down the subsidy burden for the Government. There are certain short comings with indigenous industry of which dependence on imported sources, due to non-availability of quality Phosphates in India, is the prime. The prices of imported raw materials have shown high degree of fluctuation.

The other major cause of concern is the demand, which is uncertain in the light of seasonal adversities, price elasticity and also due to other constraints existing in the agricultural sector. Agriculture in India is constrained by in-adequate water either due to lack of irrigation or seasonal uncertainty, un-remunerative prices on agricultural produce, majority of farmers and small and marginal farmers, illiteracy and lack of adequate finances. Fertiliser consumption could be influenced by each of these factors depending on each case. It is a fact that the current manufacturing capacity in the country, is sometime felt excess in view of stagnation and also fall in demand for Phosphatic fertilisers. The excess supply in the market, is necessitating extending of additional rebates to the dealers, and is denting the profit margins of the units as it is not considered by the subsidy scheme beyond a permitted level. Dealer margins is one of the prime factors for adverse financial performance of Phosphatic fertiliser industry. Hence improvement in overall position of agricultural sector would help in increasing demand for Phosphatic fertilisers.

The consequence of operating losses on a continuing basis would certainly affect the internal resources of a unit and also it's liquidity. The industry’s performance, except by a few units, has been adverse in the recent years, which is also seen in the market capitalisation of the fertiliser shares leading to a fall in share holder value. The ability of the industry to borrow for funding the investment also is affected and the general perception among Banks is not very encouraging. Though it is the performance of the unit which is the ultimate criteria for the capital markets and lenders to form a view, the industry characteristic also would cast a spell on the unit.
Adversities exist in every industry, but should not be allowed to affect the very existence, as it is in the case of fertiliser industry. Fertiliser industry in India has attained rapid growth and has process technology comparable with the best available elsewhere in the world. It needs a structural change in the system, which permits greater role for the industry than to the Government and other regulatory bodies. To make a comprehensive analysis of all the connected factors, the current study is taken up with the following objectives and hypotheses.

Objectives:

➢ To study the growth in investment and production capacity in relation to regulatory frame work of the Government.
➢ To analyse the role of Public, Co-operative and Private sectors in investment in this industry. Strengths and limitations of each sector in making further investment for industry's growth.
➢ To study the demand pattern and impact of constraints in agriculture sector on growth in demand for Phosphatic fertilisers.
➢ Carry out Investment analysis using capital budgeting techniques and also evaluate the option of investing in captive production facilities for basic raw materials.
➢ To analyse and understand the ability of Phosphatic fertiliser units to service debt capital.
➢ To analyse the capital structure of the industry and alternatives available for optimum utilisation of resources, and implications of capital market perception about the Phosphatic fertiliser industry.
➢ To study the position of international suppliers vis-à-vis Indian Phosphatic fertiliser industry, regarding price and quantity de-regulation.
➢ To analyse the cost factors and pricing policies, which determine the profitability and study the ability of the indigenous industry in controlling these factors for profit maximisation.
➢ To carry out micro analysis of the working capital cycle and position of liquidity.
➢ To study the role of Banks in working capital financing and the regulatory framework applicable for financing Phosphatic Fertiliser industry.

➢ To study the fixed capital investment and to suggest changes required in regulatory framework for achieving growth in investment vis-à-vis for growth of industry.

Hypotheses:

Tested Hypotheses:

➢ No major difference between operating profit and pre-tax profit.

➢ No significant difference exists in payback based on ROI and IRR.

➢ No significant variation between cost of equity capital and debt capital, unlike in other industries.

➢ No significant difference between Public & Private Investment and Variation in investment between the years was insignificant after 1979.

➢ Fertiliser Companies do not meet the benchmark current ratio of 1.33, set out by Banks.

➢ Variation in demand among regions is negligible and Variation in demand between the years is insignificant.

General Hypotheses:

➢ Pricing control and regulatory framework by Government is vitiating the investment climate in the industry.

➢ No management control on Working capital investment is observed.

➢ Demand for Phosphatic fertilisers is price elastic.

➢ Investment in Receivables is highest among working capital assets.

➢ Industry needs no protection against cheaper fertiliser imports.

➢ The capital structure is highly geared and promoters are not inclined to make additional investment.

➢ Inappropriate dividend policy is the main cause for adverse capital market perception.
Financial Institutions, banks and other agencies in Financial markets are ready to fund the future investments in this industry and are not worried over the current status of the industry.

Three fertiliser companies have been chosen based on the product profile and the turnover which are GSFC, GFCL and CFL and extensive financial and statistical analysis has been carried out based on the audited financial data from 1990-01 to 2001-02. The primary data covered 110 farmers from districts such as East and West Godavari, Guntur, Warangal, Kurnool, Prakasam and Medak in Andhra Pradesh, 35 people connected to fertiliser industry, 35 each from Banks and Capital markets.

The following are the findings and conclusions:

**Findings of the earlier studies.**

Fertiliser industry should look for reduction in project cost, to run on viable lines. It is felt that the fertiliser usage ratio is highly imbalanced, particularly after decontrol of Phosphatic fertilisers in 1992, and there is a need for a viable pricing policy in this sector. It is also felt much focus is required on creation of infrastructure at ports and for transportation.

The decontrol of Phosphatic fertiliser industry by the Government and the ambiguity in policy environment that prevailed thereafter, is the cause for the adverse financial performance of the industry. It is felt that the Government should create a conducive environment for growth in investment, particularly in the light of lower international prices of fertilisers and the consequential threat to the domestic industry.

Indian fertiliser industry has prominence not only in the context of its contribution to Indian agriculture but also in the international markets, it is ranked along with major producing countries. It is stated that the policy initiatives of the Government have helped in growth of the industry. As regards investment, it is observed that the investment from private sector is more in Phosphatic fertiliser production and the
Public sector in Nitrogenous sector. The need for growth in production capacity to save foreign exchange and creation of conducive atmosphere, was stressed in the study.

Another study indicated that the capacity utilisation in Phosphatic fertiliser industry has come down particularly after decontrol by the Government in 1992, as the actual production has gone up by 1% as against 7% increase in production capacity. The necessity of growth in domestic production capacity was stressed to meet the nutrient demands of agriculture. It is stated that a reasonable and attractive return is imperative for growth in investment in future.

Gain in agricultural productivity is contributed primarily by fertilisers. Indian agriculture is predominantly rain dependent and the study stressed the need for creating more rain water storage facilities and water management practices at the farm/watershed level. Constraints on this front is stated to be one of the prime reasons for lower fertiliser consumption.

Fertiliser and water co-exist and one of the studies indicated that the dry lands which are more dependent on rainfall also suffer from un-even distribution of rainfall. The fact that there is very little scope for expansion of irrigation facilities, agriculture in dry lands is impinged by this adversity and also economics of the cultivator. Fertiliser consumption is one of the sufferers in this scenario.

The study on land holdings indicated that 78% of the land holders are operating 32% of total area and it is observed that this small and marginal farmer segment is growing. The study found that large farmers invest more in modern inputs per unit of area and the small and marginal farmers have less access to technology.

The financial analysis indicated that variable cost stress is high on DAP producing companies and in general the ROI is very low due to fall in return and higher investment. The study indicated that the working capital is primarily influenced by
seasonality and disbursement of subsidy by the Government.

It is felt that the emerging market environment for fertiliser industry under WTO is challenging. The current price war is denting the profits of producers. The outlook for the industry looks more stringent with greater competition among the units.

The challenges before the industry are to improve profitability and also to stimulate demand. The industry should control marketing overheads and transportation and handling, to stay profitable. Credit exposure to dealers is becoming a risky proposition and industry should redefine its marketing approach.

Multiple cropping contributes for higher fertiliser consumption, whereas, in the light of constraints on the water front. Since there is limitation in bringing fresh land under cultivation, there is impending necessity of conserving water to carry out multiple cropping in the existing cultivated land.

Fertiliser industry has higher concentration in fixed capital investment and 82% of it is funded by loans. Debt servicing ability of the units is not satisfactory and in some cases negative networking capital is observed, and lower profit is found to be the cause.

The main reason for low consumption of fertiliser in India, is on account higher prices. It is stated low fertiliser consumption is affecting crop yield.

Phosphatic fertiliser units in India in general are incurring losses. The significant observation relates to DAP, which is stated to be losing its share among the phosphatic fertilisers.

Subsidisation by Government is within the permissible Aggregate Measure of Support of 10%, the fertiliser subsidy scheme need not be withdrawn because of WTO compliances. However, the industry should be protect against dumping of fertilisers.
by international suppliers. The industry also needs to improve efficiency to stay competitive.

Investors could look at Phosphatic fertiliser, though it is performing badly in view of biased pricing policy. It is felt that the phosphatic fertiliser industry would perform well once the nitrogenous fertilisers are decontrolled and the pricing anomaly is removed. Hence, it is felt investors could take interest in shares Phosphatic fertiliser units.

Government of India has used subsidy and pricing policy as an effective instrument for achieving significant growth in fertiliser consumption, so also in other countries. Fertiliser subsidy should continue and price hike due with withdrawal of subsidy has resulted in fall in consumption. It is observed that the consumption of fertilisers is higher in those countries, where the price is subsidised than the others.

The main observations, findings and conclusions of the current study are as follows:

1. The test of hypothesis at 4 through ANOVA (two way) revealed that both Public and Private sectors have played significant role in mobilisation of investment for growth of fertiliser industry.

2. The test of hypothesis at 4 through ANOVA (two way) confirms that the growth in investment after 1979 was high from Private sector than Public sector. This also confirms that the objective of attracting investment into fertiliser industry, envisaged in the Retention Price Scheme implemented by the Government in 1979, is accomplished.

3. As regards the behaviour of investment between the years 1961 to 2003, the Coefficient of determination at +0.38, though moderate, indicates the positive role of Public and Private sectors. The annualised investment from Public sector was higher in the initial years and by private sector in the previous two decades, due to which the correlation is moderate. With respect to pattern of investment, the Bowley's coefficient of Skewness at +0.54 and +0.85
for Public and Private sectors indicates that the annualised investment from these sectors was inconsistent and in most of the years it was lower than the mean level. This shows that higher investment was clustered in few years the past four decades period.

4. The time series analysis of production data between 1960-61 to 2001-02, indicated that the growth was higher for nitrogenous fertilisers than in the case phosphatic fertilisers, both in the NP and NPK category. The prime constraint for growth is identified to be lack of quality rock phosphate in India and the total dependence of the industry on imports for these basic raw materials.

5. Phosphatic fertiliser industry has introduced number of complex fertiliser grades. About the relevance of these grades, the production data from the years 1960-61 to 2001-02, was tested through ANOVA and the hypothesis that there is no significant variation in relevance of different fertilisers is accepted, an indication that all these grades have equal prominence. At the same time, the test of hypothesis through ANOVA about the comparative growth in production of these grades of fertilisers indicated that the growth among these fertilisers was not equal, as there was variation in demand for each of these fertiliser grades.

6. Among the Phosphatic fertiliser grades, the production of Di-Ammonium Phosphate showed higher degree of inconsistency with skewness at +0.25, than other low analysis phosphatic grades.

7. As regards consumption, Di-Ammonium Phosphate is the most widely used Phosphatic fertilisers and the trend analysis has shown that it's consumption has been higher during the Rabi season than Kharif. There are wide disparities in consumption levels among various states, due to specific constrains prevailing in each region.

8. The consumption of all fertilisers during Kharif and Rabi reflected positive correlation, DAP at 0.68. NPKs at 0.45 Super Phos. At 0.57 and for Urea very high at 0.81. The distribution of consumption in these seasons during 1991-92 to 2001-02, showed higher inconsistency for DAP with Skewness at +0.67 and
+0.25 respectively, than other fertilisers. Consumption of Urea during Kharif was more consistent as shown by the skewness at (-) 0.60.

9. The indices for consumption between 1991-92 to 2001-02, showed that it is higher in case of Urea. Complex grades showed greater consistency in growth, though it is lower. DAP whose demand significantly came down in 1993-94 recovered only from 1996-97, but it regained it's demand to remarkably higher levels thereafter. The fall in indices for Super Phosphate indicates that farmers are preferring to use more of high nutrient fertilisers than straight fertiliser like Super Phosphate. This is an opportunity for fertiliser industry to improve demand for high nutrients fertilisers like DAP and Complex grades.

10. The general hypothesis that demand for phosphatic fertilisers is price elastic is accepted, as indicated by the majority respondents who felt that the fall in demand after decontrol of Phosphatic fertiliser in 1992, was primarily on account of increase in price.

11. The consumption of Phosphatic fertilisers in Eastern part of India, shows that it is highly concentrated in States like Bihar and West Bengal and to some extent in Orissa. In most of the other eastern states the same is at a very low level. Fertiliser consumption is found to be influenced by specific factors prevailing in each of these places. The very high coefficient of variation in each of the years from 1991-92 to 2001-02, is an indication of this wide disparity. It is also observed that consumption was inconsistent as reflected by positive skewness in respect of major consuming states.

12. In the northern India, the major consuming states are Uttar Pradesh, Punjab and Haryana and in other states it has remained very low. Among these states the consumption of DAP and complex fertilisers showed greater consistency in Punjab with skewness at (-) 0.50 and (-) 0.43 respectively. The same in case of Uttarpradesh stood at + 0.50 and zero respectively for DAP and other Phosphatic fertilisers. In case of Haryana skewness stood at +0.67 and (-) 0.50 respectively. Higher consistency in consumption for other Phosphatic fertilisers shows the growing preference for these fertilisers in this region.
13. Southern states such as Andhra Pradesh, Karnataka and Tamilnadu have recorded fairly high consumption levels for Phosphatic fertilisers. In this region also, it is concentrated in the above states and in other places the consumption has been very low. Consumption in Karnataka has shown greater consistency with skewness at (-) 0.71 and (-) 0.20 for DAP and other Phospahtic fertilisers respectively. In case of Tamilnadu skewness at (-) 1 for other Phos. fertilisers shows not only consistency but also the preference of the farmers for these fertilisers than DAP which stood at +0.33. Southern states are a very good market for complex fertilisers with AP having the highest mean consumption of 11.96 lakh MTs as against 7.82 lakh MTs of Karnataka, between 1991-92 to 2001-02.

14. Western and Central India has four major consuming states which are Maharashtra, Madhya Pradesh, Rajasthan and Gujarat. The mean consumption for DAP in these states is between 3 to 4 lakh MTs, whereas, mean consumption of other Phos. Fertilisers in Maharashtra alone between 1991-92 to 2001-02 was 12.45 lakh MTs and in Madhya Pradesh also it stood at 8.07 lakh MTs. This is mainly due to higher consumption of Super Phosphate. As in the case of other regions, consumption of DAP showed +ve skewness and more inconsistency than the other category of fertilisers.

15. The rejection of Hypothesis 6 that variation in demand among various regions is negligible' is an indication of improper distribution of fertiliser consumption, in various parts of the country. The policy objective of attaining balanced fertiliser consumption throughout the country remains unaccomplished.

16. The T-test applied on data pertaining to imports and indigenous production of Phosphoric Acid and Ammonia, the basic raw material inputs, indicates that the indigenous production in case of Ammonia is higher than imports and the country is more self reliant, contrary to this, in case of Phosphoric Acid the imports are significant for the production of fertilisers as the indigenous production is insignificant. As already stated, the growth of indigenous production capacity is constrained due to lack of quality rock
phosphate ore in the country.

17. The prices of Ammonia have fluctuated more as shown by the coefficient of variation at 14% and 22% during April to September and October to March respectively of a financial year. The variation has found to be higher during the second half. As against this, the variation in prices of Phosphoric Acid was less at 9% and 8% respectively, during the two periods.

18. Using captive phosphoric Acid by importing Rock Phosphate is found to be cheaper than importing Phosphoric Acid directly. The respondents in the survey expressed that increase in indigenous production of phosphoric Acid, would compel the overseas suppliers to increase the price of Rock Phosphate for protecting their Phosphoric Acid market. As the country has to necessarily depend on imported sources for Rock Phosphate, extensive production of Phosphoric Acid may create a price new scenario. However, majority of the opinions favoured the proposal to join the existing overseas Phosphoric Acid supplier by investing in equity with buying arrangements instead of creating a grass root plant.

19. DAP is widely imported among Phosphatic Fertilisers, and between 1990-91 to 2001-02 the imports were subject to steep variations with CV at 47% as against the variation in C&F price of 13%. The coefficient of determination at (-) 0.05 between price and quantity, shows that the imports continued at higher levels irrespective of changes in import prices of these fertilisers. As regards competitive position of indigenous industry vis-à-vis the foreign suppliers, the respondents expressed that lower raw material price is an advantage for overseas manufacturers and Indian industry does not stand at parity in terms of cost.

20. In case of total decontrol, there is necessity for protecting indigenous industry from fertiliser imports, by levying higher customs duty, else the indigenous industry stands a loser.

21. About the role of the Government in this industry, it is widely believed and also true, that the policy regime has helped in garnering higher investment into the industry and also for the growth in consumption of Phosphatic
fertilisers.

22. The present scheme of concession applicable on Phosphatic fertilisers and the methodology adopted pursuant to recommendations of the Tariff Commission, is not looked upon positively by the industry.

23. The respondents from industry and other people, felt that the fiscal limitations of the Government is affecting industry's financial environment and hence it is felt that the Government should immediately decontrol the Phosphatic fertiliser sector and also nitrogenous fertilisers, for eliminating the price bias and to create a level playing field.

24. The financial analysis based on sample units GFCL, CFL and GSFC, brought out the following:

a. The positive correlation between production and investment of +1 and +0.87 for GFCL and CFL indicates that the units have not made idle investment, and also the annualised investment was minimum as shown by skewness at +0.67 and +0.20 respectively. In case of GSFC, the unit resorted to excessive investment as shown by skewness at (-) 0.4 and also -ve correlation at 0.25 an indication of idle investment.

b. The fertiliser production by sample units has followed the overall phosphatic fertiliser consumption pattern in the country, as shown by the +ve correlation with coefficients at 0.95, 0.72 and 0.11 for GFCL, CFL and GSFC respectively.

c. Sales pattern showed more focus on the manufactured products in each of the years, however, the units have increased the turnover by resorting to trading of fertilisers, when ever opportunity existed. The regression analysis of sale of manufactured and traded products indicated, a fair degree of inconsistency in turnover on traded products. Overall turnover of the sample units registered remarkable growth.

d. The cost structure has differed among the sample units. GFCL a prime DAP Unit has very high variable cost pressure which constituted 93.75% of the total cost, of which 72% is covered by raw material cost and the
balance 21.75% is towards power & utilities, transport and others. Whereas, in case of CFL which produces low analysis complex grades, the Variable cost is 82.88% of total cost and raw material only at 60.07%. GSFC is a diversified unit and the raw material cost on composite basis is found to be lower at 55.56% of the total cost. The total variable cost stood at 72.41% and fixed cost is comparatively much higher at 27.59%, than the other sample units.

e. Higher variable cost stress and low sales realisation has affected the contribution margin of GFCL, which stood at around 6% between 1999-2000 and at 9% for the entire period from 1990-91 to 2001-02, the same in case of CFL stood at 28% and 27% respectively. 23% is the mean contribution margin earned by GSFC between 1999-2000 and 2001-02, and in retrospect at 29% for the entire decade. Contribution margin on DAP is found to be lower than on complex fertilisers. Diversified portfolio also helps in earning higher contribution margins as shown by performance of GSFC. The study by ICRA Ltd., referred in this study has also indicated that the variable cost intensity in case of Phosphatic fertilisers has affected the net profit margins.

f. The mean PBT/Sales ratio of GFCL between 1999-2000 to 2001-02 stood at (-) 0.14%, caused by very low contribution margin. In case of GSFC, the contribution was high but, the unit ended up in a mean loss of (-) 4.54% due to high operating and financial leverage. This is also caused by under utilisation of asset base created by the Company. CFL, could hold on to a net margin of 7.9% during the said period. ICRA in it's study on the industry observed that the overall average net profit of the fertiliser industry declined from 12.7% in 1995 to 3.3% , a median of 3.4%.

g. The operating profit margin of the sample units has shown very high degree of variability and risk, comparatively non-operative income was consistent for the units. The acceptance of T-test carried out for hypothesis No. 1 to know the significance, indicates that the mean
OP/NS at 2.85% and PBT/NS at 4.87% are significant. This highlights the vital contribution of non-operational income to overall profit margin. There is need for fertiliser units to focus on generation of non-operational revenues also, for improving net profit margins.

h. The lower profit margin on Phosphatic fertilisers in the perception of industry, is primarily on account of inadequate subsidy from Government and also higher dealer commission. This is the majority response received in the survey from industry.

i. Fixed capital investment (FCI) is primarily constituted by Plant & machinery. The mean growth in FCI between 1990-91 to 2001-02, for GFCL was 25.66%, 49.35% in case of CFL and 188.11% by GSFC. The diversification of product portfolio is the main cause for the higher investment in case of GSFC. But, the investment by these units has found no relation with the cash earnings. CFL and GFCL have adopted a calibrated approach to investment in FCI.

j. The regression analysis of FCI in relation to total investment, showed that the units lacked a policy approach in creation of fixed assets and the investment pattern was inconsistent. The overall investment, has more working capital investment stress than fixed capital.

k. The long term gearing in the capital structure has found to be very low, with the mean debt equity ratio of the units between 1999-2000 and 2001-02 remaining at 0.67 in case of GFCL, 0.34 for CFL and 0.68 for GSFC.

l. Fixed capital investment has higher share in the total capital employed, than working capital. The ratio of Net fixed assets to Net current Assets in the total capital employed, in case of sample units is GFCL 61:39, CFL 80:20, and GSFC resorted to gross diversion of short term borrowings, due to which the ratio is 111: -11. In the light of higher working capital stress on total investment and correspondingly lower allocation of capital employed on the same, necessitated extensive short term borrowing for these units.

m. The mean Return on Investment (1990-19 to 2001-02) for GFCL stood
lowest at 8.32% as against 15.41% of CFL and 9.73% of GSFC. The ROI as in the case of PBT/Sales ratio, stood less for DAP producing unit than units producing other fertilisers. The findings of the current study correlate with the findings of ICRA Ltd., which stated that the Return on Capital Employed (ROCE) for fertiliser industry declined from an average of 20.10% in 1991 to about 9.50% with a median of 8.9% in 2001. The credit rating agency stated that the fall in ROCE is caused by falling return coupled with fixed capital investment by the industry on a continuing basis, because of capital intensity.

n. The viability of investment in fertiliser industry is measured through Internal Rate of Return (IRR) and it is found to be very moderate, and not encouraging from the point of view of value addition to the firm. CFL recorded a higher IRR at 12.95% as against 2.90% by GFCL and 5.15% by GSFC. The payback of investment is unduly long, when looked from IRR perspective, The respondents from industry felt that the stress on GP margins due to high variable cost and also the ceiling on sales realisation, is the prime cause for lower IRR.

o. No significant difference between cost of debt and equity capital is found. It is marginally over 3% at the mean level. This shows that the units have not been able to utilise the financial leverage for optimising the net profit margins. This argument is also supported by the T-test.

p. The fund flow analysis shows that the units have failed to generate adequate cash surplus from operations to support long term commitments. There is shortfall in long term funds and particularly, in the recent years it has deteriorated. This has necessitated diversion of short term borrowings. Inadequate and very low retention of profit is termed to be the prime cause for this scenario.

q. The Break even level of the units has deteriorated particularly in the recent years. For GFCL and GSFC, it stands at 101% and 122% respectively, mainly due to fall in contribution margins for GFCL and higher operating and financial leverage in case of GSFC. For CFL, it
stood at 62%. The new Concession scheme implemented on Complex fertilisers has taken out the un-intended benefit available on these fertilisers. It is true that the performance of complex fertiliser manufacturers would be affected henceforth, so also for CFL.

r. In the light of strain on cash earnings of the units, there is fall in the Debt service coverage ratio in the recent years. This could hamper, the ability of the industry to borrow for funding future investment. The DSCR stood healthy for CFL, mainly on account of higher earnings. The payment commitment on debt has found to be reasonably high for all the units, but the variation in DSCR is primarily on account of contrasting profit margins available to the units.

s. The + ve correlation between Cost of Goods sold and gross working capital at 0.98 for GFCL, 0.86 for CFL and 0.93 in case of GSFC indicates that working capital is a linear function of production / sales, and as the scale of fertiliser operations increase, the working capital investment also increases correspondingly.

t. The operating cycle is found to be too long and abnormal. In the case of GFCL the mean conversion cycle between 1990-91 to 2001-02 stood at 208 days, with peak level touching 288 days and the low at 164 days. For CFL the mean days stood at 227 and peak and low at 249 and 171 respectively. Operating cycle in case of GSFC is further stretched with mean cycle at 311 days and peak level at 401 days and lowest at 255 days. However, this is inefficiency and is not representative. The levels observed in case of GFCL and CFL show that the operating cycle is very long and over 6 months. Overstretched operating cycle coupled with positive correlation of working capital with COGS, have complicated the investment scenario in Phosphatic fertiliser industry. M/s ICRA Ltd., in its study paper identified two factors as prime for high working capital intensity, which are (i) Seasonal nature of the fertiliser consumption make for a long inventory holding period and (ii) peculiarities of administration of concession scheme by the Government.
u. Receivables from customers and Government is the prime component of working capital investment in fertiliser industry, with conversion period over two months, which at 12 year mean level for GFCL stood at 78 days, 76 days in case of CFL and 93 days for GSFC. The study carried out by ICRA also, came out with similar findings that the conversion time of debtors for the entire industry stood at 74 days in 1995 and in 2001 the same was 73 days, due to which the credit rating agency felt that there seems to be no improvement in the situation.

v. The mean net working capital ratio at 0.27 for GFCL, 0.21 for CFL and 0.02 for GSFC, indicates that the fertiliser industry is relying more on short term working capital borrowing for funding working capital investment, instead of internal resources.

w. The working capital analysis of three units with different product portfolios, indicated no distinct advantage in the working capital investment for the unit which had partially diversified into non-fertiliser activity.

x. Working capital investment in fertiliser industry, is influenced by extraneous factors and management has less control in determination of investment levels. Government policy and seasonality have been identified as major factors, influencing the industry and its operating environment.

y. Higher working capital investment coupled with excessive short term borrowings has affected the current ratio of the units. The test of hypothesis No. (5) thorough Chi-Square, indicates that in general the fertiliser units have fallen short to comply with the stipulated minimum current ratio of 1.33. The lower current ratio observed in the current study covering period from 1990-91 to 2001-02, is against the mean level of 1.67 for the period from 1970-71 to 1976-77 observed by Shri. M L Sharma in his book' Fertiliser Industry in India'. This shows that the liquidity status of the industry has been adversely affected.

z. There has been sizeable fall in market return on fertiliser shares. The test
of association between retention of profits and market price of share, by Yule's Coefficient of Association indicated no significant association between the two, contrary to the common notion.

aa. Dividend policy though significant from shareholders' current income perspective, the growth in market return on equity shares, particularly in case of fertiliser industry, is based on the future growth potential of the unit and industry in general and not the rate of dividend paid in earlier years.

bb. Based on the mean financial performance between 1990-91 to 2001-02, growth potential has been projected in case of GFCL at 9.41%, 14.04% for CFL and 5.36% in case of GSFC. This is a moderate performance, and does not encourage the investor to retain profits in the firm instead he would prefer to take higher dividend. The responses received from capital markets in the course of the survey also indicated the growth of Phosphatic fertiliser industry between 5% to 10%.

25. The portfolio risk analysis through CAPM, based on the market prices of fertiliser units from 01.04.1999 to 31.03.2003 as traded in Bombay Stock Exchange, along with corresponding daily Sensex, indicated that the risk on fertiliser scrip has been lower than market risk. However, the correlation coefficient was also low indicating negligible influence of the market on the prices of fertiliser shares, and that the prices changes are essentially stimulated because of specific issues connected to the unit or fertiliser industry. The comparative analysis through CAPM for the fiscal periods 1991-92 and 2002-03, indicated that the mean market prices have come down significantly and with regards to risk profile no major change is observed.

26. The market return on equity shares has been dismal, and is attributed to Government intervention, which is looked upon by investors as detrimental to the growth of the industry. The ambiguity prevailing in the industry is also, creating apprehension among investor fraternity.

27. The responses from the capital market also stated that performance of the unit
is more important than the industry characteristics and if the financial performance is good, the investor may not look at adversities prevailing in fertiliser industry. Hence it is felt fertiliser units which are doing well could tap capital markets for resources.

28. Financial assistance from Commercial Banks has played a positive role in growth in investment of fertiliser industry. The coefficient of correlation at +0.94 between investment in fertiliser industry and bank finance, shows that the industry availed of the assistances from Banks for funding the growing investment.

29. Credit off take by fertiliser industry ranged between 70% to 85% of the sanctioned limit between 1996 and 2001, and is found to be in line with trend observed in case of other industries in the country.

30. Though some apprehension exists among the Banks with regards to profitability and liquidity of fertiliser industry, the constraints prevailing in the industry may not affect the borrowings from Commercial Banks. The Banks are essentially looking at the performance of the unit and if found healthy, extending of loans may not be a constraint. This approach of the Banks is homogenous to all industries and hence, does not distinguish fertiliser industry based on the adversities. But, the responses of Bank officials certainly favoured total withdrawal of Government's intervention, for the growth of fertiliser industry in future.

31. Demand for fertilisers is found to be vulnerable to constraints prevailing in agricultural sector of which the prime are stagnation in cultivated land, lack of adequate and proper distribution of irrigation facilities, uncertainties in rainfall, More farmers are small and marginal farmers and the literacy level is very low, financial stress on farmer is high due to un-remunerative prices on agricultural produce.

32. The positive aspect of the whole scenario is that, farmers have shown great optimism in adopting technology, provided water is available. Consumption of fertiliser is bound to increase in the coming years, and the industry should endeavour to offer the best quality fertilisers at an affordable price. However
if the critical constraints prevailing in the agricultural sector are not adequately addressed on priority, it could affect the fertiliser consumption also, as agriculture in the current form is unviable.

33. With regards to fertiliser subsidy, farmers have felt that the fertilisers prices have to be kept low and that the subsidy on fertilisers should continue. Also the perception of fertiliser industry on this issue, favours continuance of price subsidisation, to sustain consumption at desired levels.

Based on the findings of the current study, the following measures are suggested.

1. Government of India should continue subsidising cost of agriculture inputs, but as suggested by the Tariff Commission in it's 2003 report, the same should be modified as consumer based subsidy instead of producer based subsidy. Presently there is only non-product specific subsidy for agriculture in India, which is marginally over 7% including fertiliser subsidy. The Government should instead increase product specific subsidy, so that the farmer would be motivated to achieve higher yield. The present schemes extending subsidy on agriculture, are merely input subsidies and do not motivate the farmer to achieve higher production. In the current scenario, higher agricultural productivity has been leading to fall in prices, which again is strain on the farmer. Hence Government should enhance product specific subsidies instead of subsidising input prices.

2. Government of India should articulate a long-term comprehensive Agriculture policy, in which water and fertiliser are an integral part. Fertiliser policy and policy on water conservation and distribution, should not be dealt in isolation. Adequate availability of water is the basic premise on which the ideal nutrient consumption levels have been set out at 4:2:1, by ICAR.

3. Government has set out a programme for networking of rivers and establish connectivity for distribution of water. The policy document in this regard, should include and define the role of industry in this endeavour, so that
investments could be mobilised by industries including fertiliser industry, for early completion of the projects and better management of the resources. If the role is limited to the Government, it’s fiscal limitations could constrain the accomplishment the objective in totality.

4. Phosphatic fertiliser industry should be deregulated and the manufacturers should be allowed to determine the fertiliser pricing. This requires the dismantling of adhoc concession scheme presently in force.

5. Government should immediately decontrol the nitrogenous fertiliser sector and allow free pricing, without subsidy. This requires the dismantling of Retention price scheme presently being availed of by the manufacturers.

6. As in the case of Phosphatic fertilisers, import of Nitrogenous fertilisers also should be de-canalised. However, the indigenous industry does not stand in parity with international suppliers in terms of costs and hence fertiliser imports should carry higher customs duty, for keeping up a parity. Presently the Government is extending higher subsidy on indigenously manufactured fertilisers than on imported fertilisers, to keep up the parity. However, the concessional duty extended to the industry on imported raw materials and capital equipment for substantial expansion should continue.

7. Though fertiliser consumption in the country has attained significant growth, it is concentrated in some areas only. Fertiliser industry should expand extension services to those far off places also, for widespread growth in consumption and achieving consistency in demand for fertilisers.

8. Profit margin on phosphatic fertilisers is distinctly low under the present subsidy scheme and would continue to be low even after total deregulation, since the competition is intense within the country among different manufacturers and the selling cost including dealer margin, is high. The industry should therefore exercise strict control on production costs, to exist viably.

9. Break even should be attained at a lower level, as achieving higher production volume in the current scenario where demand limitation is high, would only lead to lower margins. As higher sales realisation may not really materialise,
the industry should endeavour to minimise costs at each stage, for optimising net profit margins.

10. Investment in fixed capital indiscriminately for creation of higher production capacity could be detrimental not only in the context of profit margin but also would deny the indigenous industry of leveraging on cheaper fertiliser imports. **Make or buy decision** could be exercised if the investment and production capacity is restricted. The fact that the indigenous industry has to depend on imported sources for Phosphates and the overseas manufacturers have at their disposal basic raw materials at a distinctly lower rates, imported fertilisers continue to be cheaper.

11. Internal rate of return being very low, it would be judicious for the units to be calibrated not only in the investment decisions, but also in deciding on gearing levels in the capital structure. Higher gearing levels could be problematic but at the same time cost of debt capital is cheaper than equity capital. It would make sense for the industry to retain higher share of the profits, so that financing cost on investment in absolute terms could be minimised. Optimum investment would be most desirable approach in the light of lower return.

12. Creating captive production facilities for production of Phosphoric Acid could be cheaper now than importing, since it is carried in a limited way. Since Rock Phosphate which is the basic raw material for production of Phosphoric Acid is also totally imported, creation of extensive indigenous production capacity for the Acid could lead to substantial fall in imports, and may compel the overseas suppliers to change the pricing to protect their interests. Phosphoric Acid is the value added product and Rock Phosphate is basically an ore, and these suppliers may increase the price of Rock Phosphate and correspondingly reduce the price of Acid, to make the Acid import a viable option than indigenous production. Hence, the industry should weigh the pros and cons before committing on such fixed capital investment.

13. Intensity of working capital investment is higher in case of Phosphatic fertiliser industry. There is very little the management could do about adverse
seasonality and the consequent piling up of fertiliser inventory. But, unhealthy competition among the manufacturers has affected all the units, with extending of higher credit period to dealers and also higher margins, with the sole objective of capturing higher market share. All the units in the industry should mutually agree and adhere to market discipline, for minimising the investment in working capital and thereby reduce substantial financing cost for profit maximisation.

14. Since working capital has shown linear functional relation with cost of goods sold, excessive production should be avoided for minimising investment, particularly during off seasons. This will help in improving liquidity position of the industry.

15. Share holder value is the core objective of any business enterprise. Fertiliser industry has been not so good in creation of shareholder value. It should realise that only better financial performance would facilitate positive capital market perception. It is also necessary for the industry promote the strengths of the industry by properly communicating with capital markets, so that investor apprehensions are minimised. Many times, the investor apprehensions could originate out of irrational perceptions. Stock brokers play a vital role in this endeavour, as investor usually relies on a broker for choosing investment options. Fertiliser industry should have a more interactive mechanism with stock broking fraternity, for keeping the industry positive and live, in the views of investor. The financial policies of the units should also consider investor interest, as prime criteria.