A Study of Sales Trend and Cost Structure of Indian Fertilizer Industry

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ABSTRACT

The fertilizer industry has played a major role for mass production of food grains. Today, India stands as the third largest fertilizer consumer and producer of the world. It has been observed that the subsidies on Indian fertilizer have been rising at constant rate. This is due to the rise in the cost of production and the inability of the government to raise the maximum retail price of the fertilizers. The Indian chemical fertilizer industry is developing fast in terms of using the latest world-class technology. Indian manufacturers of chemical fertilizers are now adopting some of the most advanced manufacturing processes to prepare innovative new products to supplement the Indian agriculture. India is also ranked as the third-largest exporter and producer of nitrogenous fertilizer. Trend analysis is effective only when relevant and related items are studied together. The trend of sales indicates the direction in which a concern is going on, and on the basis of which forecast for further can be made. The trend analysis of sales helps to understand, the growth of a business enterprise Thus, the results which are shown are an enterprise has to be viewed in conjunction with the resources employed. In present paper attempt has been made to study the cost component of Fertilizer units and study. For the purpose of analysis of cost component all component cost has been calculated as percentage of sales. While to analysis the sales position of unit's trend analysis is made. Its strength and weakness and its stages where it has to improve and giving the overall position of the companies for the management for decision making so that its resources are used most effectively and efficiently. This study not only help the management, it also gives a clear - view to the owners, share holders, creditors and investors.

INTRODUCTION

Trend Analysis refers to the concept of collecting information and attempting to spot a pattern, or trend, in the information.Trend Analysis examines the tendencies by (a) selecting a representative year as the base and (b)expressing the figures of the remaining years in relation to the base year. The significance of the choice of base lies in the fact that the values of the items in the base year are assigned to be 100 and the index numbers are calculated for other years based on the amount of that item in those years. It is not necessary that a year should be chosen as the base. If there is no year which quality to be the base, for whatever reason, 'average concept' can be employed.

In India, the financial analysis made by the Stock Exchange Authorities follow 'average concept' in presenting trend data. According to the stock exchange official directory, "A trend analysis has been made showing the percentage of major items in the balance sheet, and profit and loss statement compared to a base value ....., for the purpose of calculation the base value has been taken as the average for each item over the last ten years or as many years for which the data is available".

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Trend analysis is effective only when relevant and related items are studied together. Thus, the results which are shown are an enterprise has to be viewed in conjunction with the resources employed. For instance, sales trend have to be studied along with debtors, inventory and even fixed assets, because it would be unhealthy development, if a downward trend in sales is accompanied by an upward trend in inventories and trend debts, or by a marked increasing plant and equipment, especially if financed by borrowed funds.

ABOUT THE FERTILIZER INDUSTRY

India has reached self-reliance in food-grain production. The production of food grains in India rose by an excess of 156 million MT since 1951-52. The fertilizer industry has played a major role for mass production of food grains. The fertilizer industry came into being in India in the year of 1906. The first manufacturing unit of Single Super Phosphate (SSP) had a manufacturing capacity of 6000 MT. The private sector has also contributed to the Indian fertilizer industry. Some of the notable private companies to contribute to the production are Chambal Fertilizers and Chemicals Limited and Tata Chemicals Limited. The private sector produced 44.73 % of nitrogenous fertilizers and 62.08 % of phosphatic fertilizers in 2006-07.

Today, the Indian chemical fertilizer industry is developing fast in terms of using the latest world-class technology. Indian manufacturers of chemical fertilizers are now adopting some of the most advanced manufacturing processes to prepare innovative new products to supplement the Indian agriculture. India is also ranked as the third-largest exporter and producer of nitrogenous fertilizer.

OBJECTIVES OF THE STUDY

This study is aimed at attempting the following:

- To analyze the cost structure of the companies.
- To study sales trend analysis of the companies
- To summarize the main findings of the study.

METHODOLOGY OF THE STUDY

Source of the data

A study has been made by using data from Financial Statement of selected seven Private Fertilizer Companies of India, viz., Chambal Fertilizer and Chemicals Limited, Deepak Fertilizer and Petrochemicals Limited, Gujarat Narmada Valley Fertilizer and Chemicals Limited, Mangalore Chemicals and Fertilizer Limited, Nagarjuna Fertilizer and Chemicals Limited, Gujarat State Fertilizer and Chemicals Limited and Zuari Fertilizer Limited for the purpose of analysis data has been collected from annual reports of respective companies and Capitaline data base. Information has also been collected from different websites and magazines. The study covers a period of 5 years from 2005-2006 to 2009-2010.

HYPOTHESIS FOR THE STUDY

- The Cost Structures of Private Fertilizer Companies are uniform.
- The trends of sales of Companies are uniform.

TECHNIQUES OF ANALYSIS

For the purpose of analysis of data, various components of cost has been calculated as percentage of sales and sales analysis has been made through trend. Moreover, the simple statistical techniques such as Standard Deviations, average and ANOVA test were also applied. In present study data has been converted into relative measures such as ratios, percentages rather than the absolute data.

ANALYSIS OF SALES TEND

'Sales' is the value of the output supplied to the customers. It is the life blood of

a business enterprise. Without which the business cannot survive. Further, 'sales' is the indicator of the operational efficiency of management has used the assets of the business. The higher the volume of sales, the more efficient the management. Sales is also related to Profitability of an enterprise, if other things remain constant. The higher the amount of sales, the more profitable the business is and vice versa. The matching of incurred during a certain period with sales generated during that period reveals the net income or net loss.

The trend of sales indicates the direction in which a concern is going on, and on the basis of which forecast for further can be made. The trend analysis of sales helps to understand, the growth of a business enterprise. For proper trend analysis , the trend should be studied at least over period of 5 or more years.

To study the trend of sales in Private Fertilizer Companies under study, the year 2005-2006 has been chosen as the base year and figures of sales in the base year have been taken equal to 100. Index numbers have been calculated for the remaining years based on the amount of sales for the base year.Table-1 shows the trend of sales in the companies under study:

Table-1

Sales Trend

Com. Name	05-06	06-07	07-08	08-09	09-10	Average	SD
CFCL	100	94.674	105.073	168.723	77.652	109.224	34.82
DFPCL	100	148.017	126.288	134.469	91.136	119.982	23.81
GNFCL	100	127.552	125.334	85.102	89.479	105.493	19.89
MCFL	100	126.678	118.551	151.940	84.047	116.243	25.93
NFCL	100	124.889	120.770	108.129	83.810	107.519	16.55
GSFCL	100	117.287	107.029	165.490	68.272	111.616	35.25
ZFL	100	109.369	109.219	232.648	70.23	104.294	66.52
Average	100	121.209	116.038	149.500	80.661	110.624	

Sales trend of units under study showed a fluctuating trend. CFCL and ZFL indicate an increasing trend for the four years study period. DFPCL, GNFCL, MCFL, GSFCL and NFCL indicated a fluctuating trend. The average trend of units under study was 110.624.While the average trends of DFPCL and MCFL were higher than this on other hand CFCL,GNFCL,GSFCL,NFCL and ZFL trend were lower than the average of units under study. The standard deviation figure shows a high fluctuation in trend value of all the units under study.

STRUCTURE OF COST IN PRIVATE FERTILIZER COMPANIES UNDER STUDY

The data of total cost in various Private Fertilizer Companies under study have been rearranged and classified under the following heads:

(a) Raw Materials and Stores Consumed

Raw materials consumed consists of the amount spent on various types of raw material and components consumed during the course of manufacturing. Further the figure has been arrived at by adding the cost of opening stock

of raw materials to the purchases of raw material and deducting the cost of closing stock. It also includes the amount spent on octroi, carriage inwards as well stores consumed etc.

Table-2

Raw Materials and Stores Cost as Percentage of Sales

Com. Name	05-06	06-07	07-08	08-09	09-10	Average	SD
CFCL	52.94	50.54	41.44	56.65	49.79	50.272	5.62
DFPCL	63.55	72.75	66.51	64.90	62.58	66.058	4.02
GNFCL	50.10	55.88	57.87	55.93	52.77	54.51	3.06
MCFL	73.20	68.45	69.52	72.73	71.68	71.12	2.05
NFCL	43.34	52.34	61.13	48.96	50.01	51.16	6.48
GSFCL	61.31	64.63	64.51	67.12	63.67	64.25	2.12
ZFL	80.06	82.03	78.72	91.68	78.87	82.27	5.42
Average	60.64	63.80	62.81	65.42	61.34	62.806	

Table-2 indicates the percentage of raw materials and stores cost to sales. The cost showed a fluctuating trend in all units under study. The average raw material cost of the entire study was 62.8057 percent, whereas the average raw material cost of ZFL was 82.27 per cent, which was highest among all units under study. While the raw material cost of CFCL was 50.272 per cent, which is lowest among all units under study. The average raw material cost DFPCL,GNFCL,MCFL,NFCL and GSFCL were 66.058 per cent,54.51 per cent,71.12 per cent ,51.16 per cent and 64.25 per cent respectively. The standard deviation of NFCL indicates high fluctuation in cost.

H_o = There is no significant difference in percentage of Raw Materials and Stores Consumed cost in Companies.

Table-3

Raw Materials and Stores Consumed Cost and ANOVA Test

Source of Variation	Sum of Square	df	MS	F	F crit
Between Groups	102.77202	4	25.6930	0.169135	2.69
Within groups	4557.2338	30	151.9078		
Total	4660.00582	34			

It is evident from table-3 that there is no difference in Raw Materials and Stores Consumed among the units under study because calculated value of F(0.169) is lower than the value of 2.69.

(b) Salaries and Wages

The amount paid to employees by way of salaries, wages, bonus, gratuities and contribution towards the provident funds, superannuation funds, family pension scheme, gratuity funds have been classified as 'Salaries and Wages' in the present study.

Table-4

Wages and Salaries Cost as Percentage of Sales

Com. Name	05-06	06-07	07-08	08-09	09-10	Average	SD
CFCL	2.36	2.67	2.65	1.97	2.76	2.482	0.323
DFPCL	7.38	5.73	5.50	5.89	7.36	6.372	0.921
GNFCL	6.19	6.16	5.51	7.57	7.53	6.592	0.916
MCFL	2.71	2.38	2.51	1.77	2.19	2.312	0.357
NFCL	2.70	2.62	2.70	2.79	3.89	2.94	0.534
GSFCL	7.26	5.89	5.62	6.61	7.22	6.52	0.750
ZFL	2.26	2.12	2.05	0.91	1.77	1.822	0.541
Average	4.40	3.94	3.79	3.93	4.67	4.15	

Wages and Salaries cost as percentage of sales has been presented in table-4.The portion of this cost in total cost is very low. It ranged between 2 to 6 per cent. The average wages and salaries cost of study was 29.04 per cent: While the ZFL cost is lowest (1.822 per cent) among all units under study. The standard deviation of CFCL also indicates that very low fluctuation in cost.

Wages and Salaries cost and ANOVA test

H_o =There is no significant difference in percentage of salaries and wages cost in companies.

Table-5

ANOVA

Source of Variation	Sum of Square	df	MS	F	F crit
Between Groups	3.9437	4	0.985925	0.1894697	2.69
Within groups	156.1081	30	5.203603		
Total	160.0518	34			

It is clear from Table-5 that there is no difference in wages and salaries cost in all units under study, because of table value of F is higher than calculated of F. Standard deviation also indicates very low fluctuation in cost.

(c) Indirect Taxes

The indirect taxes include excise duty charged at the time of production by the central government has been consider under this head.

Table-6

Indirect Taxes as Percentage of Sales

Com. Name	05-06	06-07	07-08	08-09	09-10	Average	SD
CFCL	3.16	2.58	2.37	1.93	3.10	2.628	0.515
DFPCL	13.56	11.78	12.41	9.78	9.63	11.432	1.702
GNFCL	12.52	13.13	11.59	7.17	7.17	10.624	2.569
MCFL	1.39	1.17	1.41	1.41	1.41	1.218	0.301
NFCL	0.91	0.79	0.61	2.26	2.26	1.064	0.788
GSFCL	10.48	8.49	7.81	5.98	5.98	7.798	1.833
ZFL	0.44	0.61	1.64	1.47	1.47	0.938	0.569
Average	6.06	5.51	5.40	4.43	4.43	5.100	

Table-6 showed a portion of indirect taxes as percentage of sales in Private Fertilizer Companies. The data showed fluctuating trends in all units under study was 5.100 per cent .Out of 7 units under study the average cost of two units were below the study average. ZFL indirect cost was lowest (0.938 per cent) among all units under study. The result of standard deviation also indicates very low fluctuation in all units under study except GNFCL.

Indirect cost and ANOVA test

Ho= There is no significant difference in percentage of Indirect cost in companies.

Table-7

ANOVA

Source of Variation	Sum of Square	df	MS	F	F crit
Between Groups	18.592243	4	4.46480607	0.1989792	2.69
Within groups	700.786057	30	23.359535		
Total	719.3783	34			

From the above table, it is clear that there is no difference in indirect cost of all units. Because the calculated value F is lower than table value of F.

(d) Power and Fuel

Electricity expenses in Fertilizer industry played a vital role. For the purpose of analysis any expense related to electricity and for other fuel have been considered under this head.

Table-8

Power and Fuel Cost as Percentage of Sales

Com. Name	05-06	06-07	07-08	08-09	09-10	Average	SD
CFCL	14.49	19.49	20.55	17.43	15.63	17.518	2.54
DFPCL	2.25	2.03	1.76	1.18	1.14	1.672	0.50
GNFCL	12.25	9.82	9.95	12.88	13.74	11.728	1.76
MCFL	15.67	14.13	15.97	11.27	12.87	13.982	1.96
NFCL	22.86	20.34	14.20	19.83	15.73	18.592	3.54
GSFCL	8.53	7.76	7.92	5.45	7.90	7.512	1.19
ZFL	7.03	6.57	5.89	3.62	4.28	5.478	1.47
Average	11.87	11.45	10.89	10.24	10.18	10.926	

Power and Fuel cost as percentages of sales presented in table-8.The range of power and fuel cost in selected units was between 1.672 to 18.592 per cent. The average power and fuel cost of the study was 10.926 per cent; while the average power and fuel cost of DFPCL (1.672 per cent) and GDFCL (7.512 per cent) were lower than the average of study. The Standard deviation of NFCL indicates high fluctuation in cost, while standard deviation of DFPCL (0.50) indicates a low fluctuation in cost.

Power and Fuel cost and ANOVA test

Ho= There is no significant difference in percentage of Power and Fuel cost in companies.

Table-9

ANOVA

Source of Variation	Sum of Square	df	MS	F	F crit
Between Groups	15.311596	4	3.827899	0.0883453	2.69
Within groups	1279.864804	30	43.328827		
Total	1315.17674	34			

ANOVA table indicates there is no significance difference in power and fuel cost among all the units under study because calculated value of F is lower than table value of F at 5% level of significance.

(e) Depreciation

In the cost structure of Private Fertilizer Company the absolute figure of depreciation is very high. So the amount of depreciation of all fixed assets is considered under this head in present study.

Table-10

Depreciation Cost as Percentage of Sales

Com. Name	05-06	06-07	07-08	08-09	09-10	Average	SD
CFCL	5.79	6.80	6.78	4.93	7.21	6.302	0.93
DFPCL	5.64	4.71	4.25	3.70	4.99	4.658	0.73
GNFCL	4.12	4.00	3.22	4.09	4.47	3.98	0.46
MCFL	1.05	1.11	0.98	0.69	0.88	0.942	0.16
NFCL	8.32	6.83	5.48	5.09	6.45	6.434	1.27
GSFCL	4.99	4.29	4.00	2.43	3.51	3.844	0.95
ZFL	0.73	0.72	0.66	0.29	0.46	0.572	0.19
Average	4.38	4.06	3.62	3.03	3.99		

Depreciation cost as percentage of sales presented in table-10.The average depreciation cost of CFCL, DFPCL, GNFCL, MCFL, NFCL, GSFCL AND ZFL were 6.30 per cent,4.65 per cet,3.98 per cent,0.94 per cent,6.43 per cent, 3.84 per cent and 0.57 per cent respectively. The table data and standard deviation indicates a low fluctuation in the cost in all units under study.

Depreciation Cost and ANOVA test

Ho= There is no significant difference in percentage of depreciation cost in companies.

Table-11

ANOVA

Source of Variation	Sum of Square	df	MS	F	F crit
Between Groups	7.432609	4	1.8581522	0.323855	2.69
Within groups	172.127945	30	5.7375982		
Total	179.5605554	34			

Table-11 indicates that calculated value of F is lower than table value so, null hypothesis is accepted. It means there is no significant difference in the depreciation cost among all unites under study.

(f) Administrative, Selling and Distribution and other Expenses

The expenses relating to office and general administration of companies like the director's fees, auditor's remuneration, legal expenses, rent, rates, taxes and depreciation of office building and equipment have been grouped as administrative and other expenses. Selling and distribution expenses include the amount spent during the course of sales, boosting the sales and delivery of goods sold have termed relating to advertisement, commission to selling agents and other incentive and service charge, delivery charges ,freight ad transportation etc are covered under the above head.

Table-12

Administration, Selling and Distribution and Other Expenses as Percentage of Sales

Com. Name	05-06	06-07	07-08	08-09	09-10	Average	SD
CFCL	10.05	9.31	12.19	8.56	10.34	10.09	1.36
DFPCL	8.08	6.69	5.56	4.22	5.44	5.998	1.45
GNFCL	6.41	6.21	4.92	4.60	5.58	5.544	0.79
MCFL	6.37	5.20	5.15	4.95	7.32	5.798	1.21
NFCL	10.35	10.21	12.06	9.61	10.56	10.558	0.91
GSFCL	5.28	6.37	5.43	3.23	5.43	5.148	1.16
ZFL	4.75	5.43	5.57	3.21	7.85	5.362	2.07
Average	10.258	9.884	10.176	7.676	10.504	9.699	

Table-12 reveals administration, selling and distribution and miscellaneous expenses as percentage of sales. The average ratio of GSFCL, ZFL and GNFCL were 5.148 per cent, 5.362 per cent and 5.544 per cent which were lower than the average ratio of companies, while NFCL ratio was 10.56 per cent highest among all units under study.

Administration, Selling and Distribution and Other Expenses Cost and ANOVA test:

H_o= There is no significant difference in percentage of Administration, Selling and Distribution and Other Expenses cost in companies.

Table-13

ANOVA

Source of Variation	Sum of Square	df	MS	F	F crit
Between Groups	18.981385	4	4.7453462	0.7583950	2.69
Within groups	187.712715	30	6.2570905		
Total	206.6941	34			

Table-13 shows that there is no significant difference in Administration, Selling and Distribution and Other Expenses of units under study because of the acceptance of null hypothesis.

(g) Financial Charges

Indian Fertilizer industry structure indicates that most of the Private Companies satisfied their financial needs though Equity, Preference, Loans and Debentures. So the portion of financial charges in the cost structure of industry has played vital role in the performance of the companies. Expenses related to interest and their financial charges have been considered under this head for the purpose of the study.

Table-14

Financial Charges Cost as Percentage of Sales

Com. Name	05-06	06-07	07-08	08-09	09-10	Average	SD
CFCL	2.67	4.08	7.26	3.03	2.78	3.964	1.92
DFPCL	1.00	1.38	1.51	2.86	3.59	2.068	1.103
GNFCL	1.73	0.66	0.41	0.97	0.98	0.95	0.50
MCFL	0.62	1.19	0.95	1.48	1.13	1.074	0.32
NFCL	9.01	7.59	7.43	7.14	7.50	7.734	0.73
GSFCL	3.04	2.29	1.26	0.66	0.93	1.636	0.99
ZFL	2.54	1.92	2.20	1.01	0.43	1.62	0.87
Average	2.94	2.73	3.00	2.45	2.48	2.72	

Table-14 reveals the ratio of Financial Charges to total sales in Private Fertilizer Companies in India. The ratio showed a fluctuating trend. The average ratio of study was 2.72 per cent whereas the ratio NFCL and CFCL were higher than average ratio of study. The standard deviation of 1.92 indicates high fluctuations.

Financial Charges Cost and ANOVA test:

Ho= There is no significant difference in percentage of Financial Charges cost in companies.

Table-15

ANOVA

Source of Variation	Sum of Square	df	MS	F	F crit
Between Groups	1.836016	4	0.459004	0.0671226	2.69
Within groups	205.148858	30	6.838295		
Total	206.984874	34			

Table-15 indicates that critical value of F is higher than calculated value of F, Meaning null hypothesis and alternative hypothesis are accepted. Result of ANOVA indicates there is no significant difference in Financial Charges cost among all units under study.

CONCLUSION

The above analysis indicates that the most influencing factor in cost structure of Private Fertilizer Company is power and fuel cost. The portion of this cost in total cost was 10.92 per cent, where the portion of raw material cost and selling and distribution and other cost in total cost structure were 62.8 per cent and 9.69 per cent. So it can be concluded that to improve the profitability of units there is a need to give proper attention towards this cost by corporate. The closer view element of GSFC was closer to the average of companies. The sales trend of DFPCL also indicates the highest trend among all units under study, where the ANOVA result indicates there is a uniform cost structure in al the unit under study.

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