

Analysis of Marketing Costs of Fertilizer

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INTRODUCTION

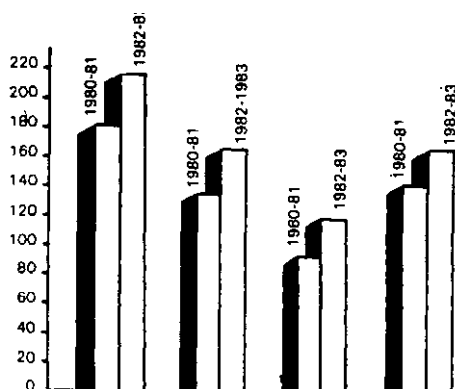
Marketing cost forms a major cost area in the Fertilizer Industry. By controlling this cost element, the industry can achieve a significant measure of economy in all its operations and thereby save the exchequer by reducing the quantum of subsidy, in addition to improving the profitability of fertilizer units.

Price has been an important influencing factor on farmer's decision to use fertilizer. Although marginal increases in the prices of fertilizers (10 to 15%) did not affect the overall consumption from the existing users with larger holdings. It had an adverse impact on the use by marginal and small farmers and those cultivating on rain fed crops.

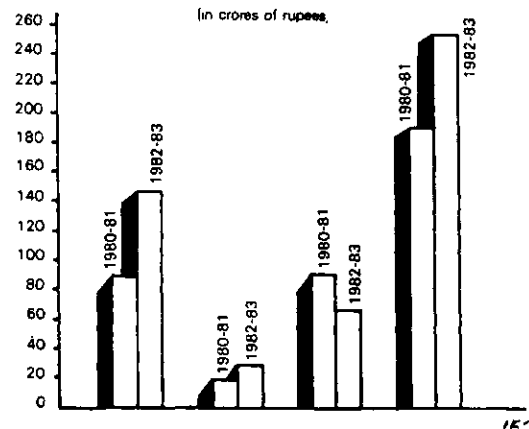
The high level of marketing costs in the fertilizer industry is not justified by the marketing functions performed by the industry, as per the several papers presented on the cost of fertilizer marketing, at FAI seminar.

The upward trend in transportation costs and the quantum of increases are reflected in the graph on page 164a.

Uptrend in transport cost 1980-81 to 1982-83 (cost per tonne in rupees)



Imported Retention price Domestic Weighted fertilisers fertilisers fertilisers average outside retention ricing



The price is largely determined by the cost of production and the marketing costs. Fertilizer marketing performance can be improved and marketing costs reduced by optimizing marketing operations. Saving could be effected in the areas of handling, storage and transportation promotion etc.

The two main factors to increase the demand for fertilizers are: to convince the farmers to apply the recommended dosages on crops already fertilized. To introduce and stimulate fertilizer use in areas and on crops not fertilized.

ECONOMICS OF FERTILIZER USE

Fertilizer consumption is affected by a number of factors such as area under cultivation, cropping pattern, weather conditions, irrigation facilities, availability of credits, prices of fertilizers, procurement prices and cultivation practices adopted by farmers. These factors have varying degrees of impact on the fertilizer consumption. The influence of these factors are felt differently by the farmers of various sizes of land holdings.

The medium and large farmers with holdings of more than 2 ha. of irrigated area generally consider the commercial viability. In this case, the prices of inputs and crop produce by a mjoyr role play a major role in selecting the cropping mix and the use of various agro- inputs -seeds, fertilizers, pesticides and other agro- chemicals. The small and marginal farmers whose land holdings are less than 2 ha.

are guided by more by personal consumption than by commercial viability as they may not have marketable surplus. They are the majority (72%) of the farmers. The cost benefit analysis of fertilizer use is relevant for stimulating fertilizer use.

In the fertilizer marketing system not only the cost of marketing the fertilizers but also the economics to the farmers for use of the fertilizer to be considered.

Fertilizer marketing involves a variety of functions; each of these elements has an associated cost element. The fertilizer industry is required to maintain data relating to the costs for claiming the subsidy from the GOI. The major cost elements, are: Transportation & handling, Storage, Promotion, Advertising and sales promotion, credit and other marketing overheads. The following table provides a sample case of costs involved in marketing.

Table No.1
Elements of the Fertilizer Marketing costs 1985

A sample		
Cost Elements	Rs./Tonne	Percentage
Transport & handling	127.56	37.5
Distribution Margin	121.33	35.7
Inventory carrying	32.67	9.60
Promotion	5.00	1.46
Others	53.56	15.74
Total	340.12	100.00

Source: A study of Marketing of fertilizers in India (1985)
 By Dr. V. S. Ramaswamy Madras.

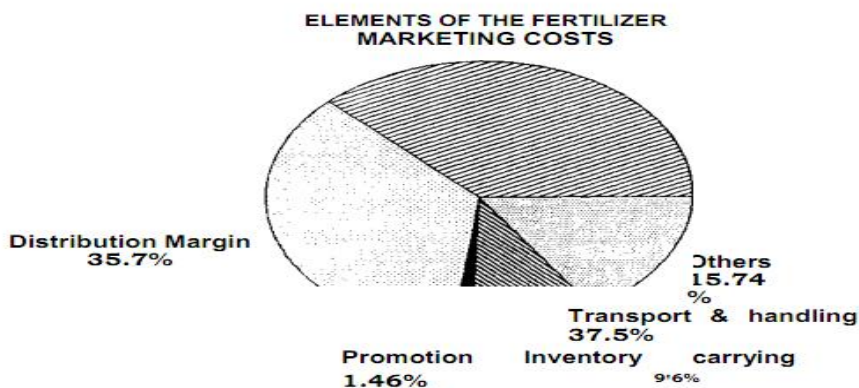
A graph giving a comparison of marketing costs element wise is given on page 67a

It is seen from the table that transportation alone accounts for 37.5% of the toted marketing cost. This includes primary movement from plant / port locations to the rail heads in case of transportation by rail and the secondary movement from rail head at the destination end , to the stock points or warehouses. In case of road movement there are no secondary transportation as the products are directly delivered to the stock points. The cost of handling is also included. Any efficiency to reduce the cost of this element by choosing a proper mod mix (rail/road), Choosing the territory of marketing operations will help bringing down the cost of marketing.

Dealers margin is another important area of fertilizer marketing cost but there is hardly any scope to reduce this element as this would de-motivate the dealers.

Promotion expenses account only 1.5% of the marketing cost, in order to create the required awareness, promotion and extension support are essential aspects of marketing in fertilizer industry. Lack of awareness to the economics of fertilizer use and scientific cultivation are the important factors for the non-use of fertilizers according to NCEAR study referred earlier in this context this marketing aspect must be made more effective.

The other costs include the marketing overheads - Salesmen remuneration & other administrative overheads. These are also cost effective elements. Periodical evaluation of the impact of each of these elements is necessary.



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On an All India basis of the total amount of Rs.542 Cr.incurred towards marketing costs in 1980-81, transportation accounted for the mcyor portion.

Table No.2

Marketing costs

Element	Marketing costs (percentage)
Transport	31
Dealer margin	24
Inventory carrying	31
Others	14
Total	100

Source : A Study on the Marketing of fertilizers in India (1985) By Dr.V.S.Ramaswamy, Madras.

The marketing costs in the fertilizer industry works out to 30% of the sales turnover. This is considered very high as compared to the marketing costs of consumer products. Transportation,Inventory control and distribution margin account for 86% of the marketing cost.

TRANSPORTATION COST

Transportation is a mtyor marketing function in fertilizer marketing system. The efficiency of the system is largely measured by the transportation efficiency. It is a major cost element. The distribution of the statutorily controlled products are determined by the Essential Commodities Act. Fertilizer is a bulky product and it has to reach the nook and corners of the country where the transportation infrastructure has not developed.

Table No.3 Trends of transportation of fertilizers in India

Year	Qty. Transported Million Tonnes
1959	1.8
1969	4.1
1979	12.8
19 89	24.5
1990	25.2
1992	27.9
2000*	40.0

* (Projection)

Source : Fertilizer Statistics 92-93 Page 1-85 & A Study of the Marketing of fertilizers in India by Dr.V.S. Ramaswamy (1985).

The volume of fertilizer products transported increased 3.5 times during the period 1979-92. It is projected at 40 million tonnes per annum by the turn of the century.

Fertilizer is a time sensitive product.The fertilizer product is required at a few spells during the main agricultural seasons Rabi and Kharif. The right products have to be made available at the right time and place.Fertilizers are transported by the available mode of transportation and most often not the cheaper mode, if the logistics planning is not made well ahead. An analysis of the inter firm marketing costs reveal that a significant part of the costs are controllable and that a great deal of avoidable costs are incurred in transportation; by a proper rationalization savings can be effected and the subsidy burden can be minimized.

Table No.4

Inter firm comparison of transportation costs-1982-83 Complex products

Sl.No.	Fertilizer Unit	Cost of Transport Rs./T
1.	FCI 203	
2.	GSFC 99	
3.	ZACL 177	
4.	MFL 274	
5.	SPIC 164	

6. CFL 164
7. FACT 244
8. RCF 199
9. IFFCO 257

Source: A study of the Marketing of Fertilizers in India by Dr.V.S.Ramaswamy, Madras , pages 158 -'62.

Production facilities are developed close the basic raw materials/close to the sources of feed stock such as Naphtha (refineries), Coal, Gas, Lignite,Fuel oil, etc and also in port cities (imported raw materials/feed stock). The location of the Fertilizer plants in India-FCI Ramagundum (Coal),NLC- Neyveli (lignite),IFFCO, KRIBCO, (gas Gujarat), MFL, ZUARI, FACT, RCF, CFL, etc;

The consuming centers are spread all over and high consuming points are; close to irrigation facilities, along major rivers; Ganges (U.P), Cauveiy (Karnataka, Tamilnadu), Godavari(A.P) etc, Fertilizer producing states and consuming states are far removed

Fertilizer products move across the country in a criss cross manner. Plants located in the far west in Gujarat make supplies to consuming centers in far south and vice-versa.

The transportation cost for IFFCO is the highest since the product is moved over the longest distance - from west (Gujarat) to consuming points in south, east and north. Similarly products from FACT (Kerala) move up north (Punjab, U.P.,M.P.).

Products from MFL (Madras) moves to Kerala. FACT (Cochin) moves products to Tamil Nadu and also the territory served by MFL. Similar is the case with SPIC (Tuticorin).

The table reveals that the transportation cost is the least for GSFC. GSFC has confined its marketing territory to the economic zone based on the cost of transportation.

By optimizing the modal mix and by reducing the lead through rationalization transportation costs can be substantially reduced.

FERTILIZER PROMOTION COSTS

Advertisement and sales promotion are important aspects of marketing management.

Awareness to fertilizer use and its economics must be convincingly conveyed to farmers. Indian literacy level stands at 63.09% (male) according to 1991 census .It

varies from 51% (Arunachal pradesh) to 94% (Kerala). The literacy level among the rural population is much less that too among the farming community with small and marginal holdings. Advertisement in newspapers has very little reach. Hoardings & Wall paintings are extensively used by the fertilizer and other agro - inputs marketing industries.

Promotion not only helps in conversion of a potential demand in to actual demand but serves as a very important tool for transfer of agricultural technology through conducting various programs which reach farmers and gets the desired impact. Marketing cost in this element must be judiciously used.

Depending on the reach, impact, availability of the media and the cost involved in the operation is carried out. The expenses incurred on promotion by fertilizer units is not adequate. As this cost element is not fully covered by the fertilizer subsidy, manufacturing / marketing units exercise restraints in this area .An analysis of the costs incurred by nine major fertilizer manufacturers reveal that on an average only 1.46% of the marketing cost is accounted for by the promotional expenses.

There has not been adequate research to evaluate the reach and impact of advertisement and sales promotion. There exists significant overlapping and confusing communications from manufacturers. Attempts are made to nullify the impact one firm by the other through press advertisements, farmer dealer meetings and village adoption programs.

WAREHOUSING COSTS

The warehousing function in the fertilizer marketing system consists of establishing and running a network of warehouses in the field and managing the inventories of different products depending on the seasonality , crop pattern, monsoons, and availability of storage space and the transportation. Its location availability of transport and handling facilities determines the costs. The rates offered by public sector warehousing corporation and storage facilities of private parties significantly vary. An analysis of the costs of inventory carrying of a sample of nine manufacturers reveal that on an average it's cost accounts for 9.4% of the total marketing cost.

Central Warehousing Corporations (CWC) & State Warehousing corporations (SWC) are the major agencies providing the storage facilities for fertilizer marketing. Several private agencies are now coining up to provide services at competitive terms.

The cost control area in warehousing is the space reservations with the CWC & SWC. The demand for space

is far greater than the availability since the capacity increase has not been adequate.

Manufacturers reserve more space than required and move products in excess of the requirements. As a result of this the utilization of space will not be adequate and would push up the unit cost of warehousing. Realistic demand forecasting district wise would help in controlling this cost.

Inventory carrying costs accounts for 31% of the total marketing costs. It is therefore an important area forecast control.

	Y	X1	X2	X3	X4	X5	X6	X7
77-78	100	100	100	100	100	100	100	100
78-79	111	109	93	115	95	52	101	101
79-80	102	145	93	132	82	42	104	92
80-81	106	138	81	132	86	45	114	118
81-82	100	177	79	151	112	41	124	146
82-83	101	206	87	180	142	331	113	79
83-84	102	241	78	183	133	510	116	85
84-85	108	272	77	201	141	514	107	60
85-86	99	353	123	198	224	734	100	39
86-87	95	394	128	210	278	1271	100	38
87-88	79	474	119	217	284	951	103	24
88-89	119	338	54	226	209	1345	101	17
89-90	83	564	142	242	165	713	101	13

MULTIPLE REGRESSION ANALYSIS ON MARKETING COSTS

With a view to analysing the marketing cost and to estimate the relative impact of each of the elements of the marketing costs on the sales performance, a multiple regression model has been developed based on seven factors (elements). . Marketing cost data for 15 years from two manufacturing units (SPIC & MFL) was obtained to develop the model.

$$Y = A + A1 X1 + A2 X2 + A3 X3 + A4 X4 + A5 X5 + A6 X6 + A7 X7$$

Where Y is the sales performance, Xi is the cost elements considered for the model: X1 is the per tonne average cost of marketing overheads.

- X2 is the per tonne average cost of promotion
- X3 is the per tonne average cost of transportation
- X4 is the per tonne average cost of storage & handling
- X5 is the per tonne cost of rebates
- X6 is the per tonne cost of Margin to dealers/ coops.
- X7 is the per tonne cost of credit

A1 A7 are the regression coefficients.

The data pertains the average transportation cost of the two units.

Table No.5

Multiple Regression Analysis (MRA) of Sample data on marketing costs Base year -1977-78

Year	Sales	Cost elements						

With a view to maintain confidently, the actual cost and the sales performance have been converted into indicies with 77-78 as the base year. The column under sales refer to the indicies of the sales performance over the 15 year period and similarly the data under the elements X1 X7 refer to the indicies in respect of the cost elements.

The objective of this analysis is to measure the relative impact of each one of these elements to the overall sales performance

REGRESSION OUTPUT

R2 = 0.9. Degrees of freedom 5

Regression of Y on all the cost elements:

$$Y = 197.52 - 0.09 X1 - 0.17 X2 + 0.40 X3 + 0.07 X4 + 0.01 X5 + 1.38 X6 + 0.34 X7$$

REGRESSION OF Y ON PROMOTION ALONE:

When the impact is measured on promotion alone , the coefficient of determination (R2) reduces to 0.7 which indicates a lower level impact compared to effect of all the six elements (R2 0.9) .

$$Y = 134 - 0.35 X2 \quad R2 = 0.7$$

The regression coefficient indicates the contribution promotion has made to the sales performance.

R2 on the MRA indicates the extent of combined effect of the cost elements considered on the aggregate sales performance.

The Multiple Regression Analysis reveals that promotion (X2) has had little influence on stimulating consumption, while transportation (X3), Distribution Margins (X6) and credit (X) significant impact on the sales performance.

The analysis reveals that promotional programs have to be improved and made cost effective. While during the early period it had an impact, at later years the programs were focused on the target group who needed little of the promotion to use fertilizers. Promotions should be diverted to new and unexplored areas.

Increased cost on transportation has had an impact. When manufacturers shifted greater portion of the movement to road from rail the cost went up and the performance also improved. Similarly on distribution margins and credit.

The promotion strategies have to be changed to create the required impact. Due to routinized and overlapping promotional programs undertaken by the fertilizer marketers it not indicate any impact. Improved transportation facilities with increased expenses indicate better yields.

CONCLUSION

The discussion and the analysis of the marketing costs, element wise, indicate, scope for reduction of costs in the area of transportation warehousing inventory control.

In this chapter, methods of reducing marketing cost at micro level and macro level have been discussed with illustrative example.

It is essential for the fertilizer manufacturing units to periodically evaluate the impact of the marketing mix through a cost and performance analysis as indicated in the multiple regression analysis given above to make the marketing programs cost effective in the long run.

Utilizing the available computer software packages it is possible to make such an analysis once in a quarter.

Developing and motivating retail outlets and utilizing the manpower and infrastructural facilities available with cooperatives to the maximum extent would help stimulate fertilizer consumption.

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