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ECONOMICS OF PROCESSING FRUITS AND VEGETABLES - A COMPARATIVE STUDY OF PRIVATE AND PUBLIC SECTOR ENTERPRISES

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Fruits and vegetables processing is an important agro-based industry which not only promotes efficient use of the available horticultural products but also earns substantial foreign exchange by way of exports. As an agro-based industry, fruit and vegetable processing provides the crucial farm-industry linkage for the sustained development of horticultural industry in the country. This industry provides substantial backward linkages in terms of supply of credit, inputs and other production enhancement services and also forward linkages in the form of processing and marketing. These linkages result in value addition to the farm produce, generating employment opportunities, checking rural exodus and increasing farmers' income. This fact has been empirically supported from the studies by Rehman (1985), Mohammad and Raghuram (1987) and Surendra (1989). In view of these facts, the food processing sector has been rightly identified as thrust area under the new economic policy of the Government. However, sustained growth of this industry depends on the viability which is largely determined by the cost of production and management efficiency.

For the success of any industry/firm, efficient production management is a pre-requisite. The cost of production is one of the important variables influencing the profits which is also an indicator of management efficiency. Thus, a study into the cost of processing provides an insight on the strength and weakness of the concerned processing units. Another important aspect is that the processing industry consist of public, private and cooperative sectors. In the recent years, particularly with the liberalisation of the Indian economy a debate has emerged questioning the functional efficiency of the public sector units. Much attention has also been focused on the government policies involving transfer of assets from public to private sector. Privatization is

resorted with the desire for lesser government participation and to improve the efficiency. But this has been resisted by the existing units because of their shaded functional efficiency. Therefore, a comparative study of public and private sector units will help to understand the relative efficiency of these units in the context of government policy. From this point of view this study examines the relative efficiency of two fruits and vegetables processing units located in Bangalore, one in the public sector and the other in the private sector.

Data and Methodology

Karnataka is the 5th largest fruit and vegetable producing state in the country. Fruits and vegetables are extensively grown in and around Bangalore and a number of plants processing fruits and vegetables are situated in Bangalore city. Two leading processing units operating one in the public sector and the other from the private sector have been purposively selected for the study. The identity of these units have not been revealed for specific reasons. The public sector unit is a Government of Karnataka undertaking established in 1975 at a project cost of Rs. 15 lakhs. The unit is well equipped with latest indigenous machinery with an installed capacity to manufacture 1000 tonnes of finished products. The private sector unit was established as early as 1948 with an authorised share capital of Rs. 100 lakhs. The unit is well established with an installed capacity to process 34080 tonnes annually.

Simple tabular analysis was used to analyse the processing cost of finished products and benefit-cost ratios. Similar methods were used by Muralidharan (1981), Acharya (1984) and Rajagopal (1984) to study the economics of various agro processing industries. In order to determine the minimum working capacity of the selected processing units, break-even volume was worked out, equating total costs with total revenue.

The cost of processing of all the products was considered together instead of individual items. Analysis of cost of processing of individual products would have been more meaningful indicating the relative

profitability of different products. However, the processing units were reluctant to reveal the cost of processing for individual products.

The data for the purpose was drawn from the balance sheet and profit and loss account for private sector unit. In case of public sector unit, no separate financial statements were maintained. Since processing was a subsidiary, the data were obtained from the management records. The analysis was carried out for a the period 1984-85 to 1987-88.

Results and Discussion

The costs associated with the processing of fruits and vegetables were broadly categorised into two heads, namely, fixed and variable costs. The detailed components of these two cost items are provided in Table 1. The major cost components under fixed costs were depreciation, advertisement, salaries and maintenance. These costs together constituted 23.61 per cent of the total cost in the private sector unit. In the public sector unit, the same cost accounted for 23.50 per cent of the total cost. Higher depreciation cost and lower salaries in the private sector unit, reflect the state of technology used in the production, implying that the unit is modern and capital intensive. Salaries formed (14.24%), a higher cost item in public sector unit followed by advertisement expenses (4.65%), repairs and maintenance (4.35%) and depreciation charges (4.25%). The public sector unit in order to minimize the losses and to earn reasonable profits has to make efforts to reduce the salaries and advertisement costs. The advertisement cost accounting for 5 per cent of sales value was very high compared to that of private sector unit which was just around 2.0 per cent of its sales value. These costs have to be reduced and sales have to be increased correspondingly.

The major items which constitute variable cost in processing fruits and vegetables are, fruits, sugar and packaging. These cost items accounted for 51.85 per cent of the total cost in private sector unit and 55.78 per cent in public sector unit. The share of packaging costs was the highest in the total cost in both private and public sector units. It accounted for 25.87 per cent (Rs. 4.13) of total cost in private sector, while the same accounted for 34.32 per cent (Rs. 3.47) in public sector

Table 1 : Cost structure of processing fruits and vegetables in private and public sector units (Rs./kg of processed product, 1984-87 average)

Particulars	Private Sector		Public Sector	
	Average cost	% share	Average cost	% share
Fixed costs				
1. Depreciation cost	2.93	17.59	0.43	4.25
2. Rents, rates and taxes	0.19	1.14	0.16	1.58
3. Repairs and maintenance	0.21	1.26	0.44	4.35
4. Insurance	0.03	0.19	0.04	0.40
5. Salaries	0.16	1.00	1.44	14.24
6. Advertisement	0.63	3.76	0.47	4.65
Total	4.15	24.90	2.98	29.47
Variable costs				
1. Fruits	2.08	12.48	1.08	10.68
2. Sugar	2.25	13.50	1.89	10.78
3. Packaging cost	4.13	25.87	3.47	34.32
4. Wages	0.01	0.06	0.46	4.55
5. Power and fuel	0.47	2.82	0.04	0.40
6. Excise duty	1.31	7.86	0.24	2.37
7. Miscellaneous	2.08	12.48	0.75	7.42
Total	12.52	75.10	7.13	70.53
Grand Total	16.67	100.00	10.11	100.00
Gross Sales realisation/kg	22.54		8.22	
Benefit-cost ratio	1.40		0.81	

unit. The lower cost towards wages in private sector unit and higher wages in public sector indicates that public sector unit is less capitalintensive than the private sector unit. This was further substantiated by the relative differences in the case of power and fuel use. The cost on power and fuel was lower in public sector unit and it formed only 0.4 per cent of the total cost, while it was 2.82 per cent in the private sector unit.

On an average, the total cost of processing per kg of processed products worked out to Rs. 16.66 and Rs. 10.11 for private and public sector units, respectively. Though the cost of processing per unit was comparatively low in public sector unit, in reality it was not reflected in terms of profits from the finished products. This is because of the fact that as much as 60 per cent of the product mix consisted of semi-processed product in the form of fruit pulp. The cost of processing fruit pulp is relatively low because it does not involve much of the subsidiary

raw materials like sugar, flavouring agents, etc. The cost of packaging is also less in this case. The per unit realisation is also less in case of public sector unit since semi-processed products are priced low, when compared to finished products.

Although there is no definite pattern in the year to year variation in costs, yet they have increased from 1984-85 to 1987-88 in both the units (not reported due to want of space). The increase was mainly because of depreciation cost, rent, interest and taxes, advertisement and costs towards fruits and sugar in private sector unit. In the public sector unit, in addition to the above costs, packaging costs had also increased substantially (184 per cent) over the years. In consonance with the increase in costs, the gross sales realization per kg of output has also increased by 49.9 per cent in private sector unit, while in the public sector unit, it decreased by 22 per cent. The decrease in the sales realisation adversely affected the profits of the public sector unit. The benefit cost ratio was 1.4 for private sector unit, indicating that for every rupee of investment, a return of Rs. 1.40 was realised in case of private sector unit, while in the public sector unit, the ratio was lower than unity (0.81), implying that the unit was incurring heavy losses and production was not at all viable. This suggests that the viability of the public sector unit is at stake unless the management takes immediate corrective steps to improve the benefit cost ratio by increasing the sales realisation.

Capacity utilisation

Capacity utilisation is one of the important indicators of operational efficiency of a processing plant. It is generally recognised that a high level of capacity utilisation is imperative for reducing costs of production. The year-wise capacity utilised by the two fruit processing units is shown in Table 2. It could be seen that, on an average, 43.5 per cent of the installed capacity was utilised by the public sector unit as compared to 32.5 per cent in case of private sector unit. The higher capacity utilisation in the public sector unit was mainly because of the lower installed capacity of 1000 MT as against the 34080 MT in the private sector unit. The capacity utilization has remained almost the same, with little variation over the years in the private sector unit, while

in the public sector unit, a substantial increase was noticed in capacity utilization from 9.5 per cent in 1984-85 to 74.7 per cent per cent during 1987-88.

Break-even analysis

Further, in order to determine the minimum capacity utilization for viable production, break-even volumes were determined with respect to both the units. The break-even analysis is useful in understanding the relationship between the level of production, revenue, variable cost and fixed cost, and their influence on profitability. As such it has a wide variety of uses in decision making. The break-even volumes of production for both the units were determined. As seen in Table 3 that the private sector unit with the installed capacity of 34080 MT per annum incurred a fixed expenditure of Rs. 5.46 crores while the public sector unit with a capacity of 1000 MT per annum incurred a fixed expenditure of Rs. 8.51 lakhs. The higher cost on plant and machinery is reflected in a higher depreciation expense of Rs. 2.93 per kg of processed product incase of the private sector as against Re. 0.43 per kg of the public sector.

Table 2 : Trends in output, capacity utilisation and sales of private and public sector processing units

Year	Output (mt)	Capacity utilisation (%)	Sales (Rs Lakhs)
Private sector unit			
1984-85	11603.05	34.05	1760.36
1985-86	11207.01	32.88	2043.31
1986-87	9778.34	28.69	3083.94
1987-88	11705.00	34.32	3114.28
Average	11073.35	32.49	2250.47
Public sector unit			
1984-85	95.00	9.50	10.01
1985-86	393.00	39.30	21.06
1986-87	505.00	50.50	41.95
1987-88	747.00	74.70	64.82
Average	435.00	43.50	34.46

Table 3 : Break even volume of production in private and public sector units (Average for 1984-85 to 1987-88)

Particulars	Private sector unit	Public sector unit
Fixed cost (Rs./kg)	4.15	2.98
Variable cost (Rs./kg)	12.52	7.13
Total cost (Rs./kg)	16.67	10.11
Gross realisation (Rs./kg)	22.74	8.22
Total fixed cost (Rs.)	546,23,107.00	8,51,5000.00
Break-even volume (MT)	5344.70	781.20
Break-even capacity (%)	15.68	78.12

As explained earlier lower wages (Re. 0.01) and the higher expenditure on power and fuel in the private sector unit vis-a-vis the public sector unit indicate that the former is more modern and capitalintensive when compared to the later. A high wage component of Re. 0.26 per kg is evident in the public sector unit. With regard to average sales realisation per unit of output, striking differences were observed. While the private sector unit realised on an average Rs. 22.7 per kg of processed product, the public sector unit obtained only an average of Rs. 8.22 per kg. This apparent difference was due to the product mix. In case of public sector unit, 60 per cent of the processed product consisted of fruit pulp which was processed for contract and normally priced low around Rs. 6 per kg.

In view of the glaring differences in the gross margins obtained by the two units, marked differences was also observed in the break-even volume of these units. While the private sector unit achieved no profit-no loss at 15.68 per cent (5344.76 MT) of its plant capacity mainly due to profitable product mix and efficient utilisation of physical and managerial resources, the public sector unit has to work at 78.12 per cent (781.19 MT) of its limited plant capacity for full recovery of costs. The margin of profits on public sector unit was very low because the break-even volume can be attained at almost 80 per cent of its capacity, whereas in the private sector unit, the break-even volume was at 16 per cent. This

major difference discourages the public sector for expanding its plant capacity to a greater extent. In case of private sector unit, the wide margin encourages them to increase its production as well as sales, providing ample opportunities to realise the economies of scale and increase the profit above break-even point.

Product mix

Table 4 gives the details of quantity and proportion of various processed products manufactured in each of the units. From the Table, it is clear that the private sector unit produced a wide range of products. This included products like squashes, jams, sauces and ketchup, juices, pulp, vegetable products such as fruit cocktails of different flavours like mango, orange, pineapple, lemon, tomato, etc. Squashes, jams and sauces formed bulk of the product line (84.04%). Squashes had a major share (37.08%) followed by jams (23.78%), sauces (23.28%), pulp (6.82%), juices (4.51%), vegetable products (2.74%) and other miscellaneous items (1.79%). In case of public sector unit, most of the processed products were fruit based such as pulp, squashes, jams and sauces and juices. Fruit pulp alone constituted the major share, accounting for 60.78 per cent of the total product line followed by jams

Table 4 : Product-Mix of the selected processing units

Products	Private Sector unit		Public sector unit	
	Quantity (mt)	% to total	Quantity(mt)	% to total
Squashes	4106.62	37.08	42.52	9.78
Jams	2633.55	23.78	62.47	14.36
Sauces	2577.44	23.28	39.72	9.13
Juices	499.70	4.51	25.90	5.95
Pulp	755.39	6.82	264.39	60.78
Vegetable products	303.03	2.74	-	-
Miscellaneous	197.89	1.79	-	-
Total	11073.30	100.00	435.00	100.00

(14.38%), squashes (9.75%), sauces (9.13%) and juices (5.95%). The unit processed these products in different flavours. Thus the public sector confined to a narrow range of product line and the bulk of the product consisted of semi-processed product namely fruit pulp.

Conclusion and Policy Implications

The foregoing analysis indicates that the public sector unit has to go a long way in order to improve its viability and ensure a self-sustained growth and there is no prima-facie indication to show that the fixed costs are high. In spite of improvements in the capacity utilisation over the years, the public sector unit failed to achieve the break-even level and continued to suffer losses. There is an urgent need to improve the sales realization by the public sector unit. In a competitive market, production is often constrained by demand unless the markets are properly developed. Increasing production without creating adequate demand through advertisement, proper distribution network and exploring new markets, will result in accumulation of inventories, thereby affecting gross sales realization per unit. The primary focus of the public sector unit to survive in the market should be creation of brand loyalty and gearing the entire production efforts towards this objective. The present product mix in the public sector unit, the predominance of bulk products like pulp manufactured on custom basis, is bound to depress the sales revenue. This can not be banked upon in the long run unless it can establish its own brand in the market.

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