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DAL MILLING VENTURE FOR RURAL SUSTAINABLE DEVELOPMENT

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Abstract- The study revealed that the dal mill owners are themselves working as the manager as well as the decision maker of processing units. The per dal mill total capital investment cost was Rs. 43,11,723.60, Rs. 76,55,497.50 and Rs. 1,19,16,452, respectively for the small, medium and large sized dal mills. The main product (whole dal) contributed about 94 per cent of the total returns and the remaining 6.76 per cent contribution was made by the value of total by-products. The per dal mill net returns over total variable cost was estimated to Rs. 77,27,688.52 and that over total cost came to Rs. 63,89,614.31 during the year. Whereas, the per quintal net returns over total variable cost worked out to Rs. 415.62 and that over total cost to Rs. 343.66. The BCR in pulse processing worked out to 1.09. The BEP of pulse was 26.29, 13.48 and 10.28 per cent of the actual quantity processed by these mills, respectively. The efforts should, be made to utilize the available capacity of the dal mills. In this context, it is suggested that the millers should not only carried out the activity of procuring pulse, processing it and selling the finished products in the market but should perform the job of customer's processing by extending pulse processing services to the people as and when available.

Keywords- Dal Mills, Pulse processing, BEP (Break Even Point, Economic analysis, Capital investment

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Introduction

The Agro Processing Industry is regarded as extended arm of agriculture. The development of the processing industry helps to stabilize and make agriculture more lucrative and creates employment opportunities both at the production and marketing stages. In Maharashtra the area under the total pulses was 3.38 million ha (2009-10), production 2.37 million tonnes and productivity 702 Kg ha^{-1}, whereas, in India 23.28 million ha area was under these pulses, with 14.66 million tonnes production and 630 kg ha^{-1} productivity. The Maharashtra state contributes to the 14.50 per cent of the total area and 14.66 per cent of the total production of India. In view, there is a very vast scope in the processing industries of pulses in Maharashtra. Therefore, attempt has made to study the economic analysis of selected pulse processing mills in Maharashtra.

MaterialsandMethods

The choice of Solapur district (Barshi tahsil) was purposive. The study was based on the micro level data obtained from the sample of 20 dal mills located at the Barshi tahsil. The data on various aspects of capital investment in dal mills, out-turn of dal and by products, costs and returns of pulse processing, income, etc. were obtained from the dal mills owners for the year 2011-2012 by the survey method with help of pre-tested questionnaire especially for the purpose. To facilitate analysis of data, the sample dal mills were divided into 3 size groups *viz.*, small, medium and large on the basis of processing capacities ranges as 25-75, 100-150 and 175- 200 q of raw pulse per day, respectively. Seven mills each under small and medium size groups and six mills from large size group were, thus, distributed. The data collected from the sample dal mills were compiled according to their individual size groups. The data so compiled were further analysed to obtain means and percentage relative to different aspects of pulse processing. The estimates of different variants were obtained on per unit basis for the individual size groups of dal mills.

Efforts were made to estimates breakeven point and benefit-cost ratio to compare the relative economic efficiency of the individual size group of dal mills.
The break-even quantity of pulse was estimated as

$$Q = \frac{TFC}{(Gi - AVC)}$$

Where,
Q = Quantity of pulse processed in q required for break- even
TFC = Total fixed cost of dal mill per annum
Gi = Gross income per q of pulse processed
AVC = Average variable cost per q of pulse processed.
The benefit-cost ratios for average dal mills from individual size groups of sample dal mills were worked out by applying the following formula.

$$\text{B-C 'ratio'} = \frac{Tr}{Tc}$$

Where,
B-C 'ratio' = Benefit-cost ratio
Tr = Total returns per quintal of pulse processed
Tc = Total cost per quintal of pulse processed

Results

The processing activity being an important economic aspect in realizing the better price for the agricultural product, the processing of pulses becomes an important agro-based industry of Maharashtra in general and for Solapur district in particular.

Capital investment in dal mills

The dal mill is a capital intensive enterprise [7]. The similar situation could also be seen about the sample dal mills. The magnitude of capital investment varies with

the size of the dal mill [Table-1]. At the overall level, the total investment in capital assets inclusive of land worked out to Rs. 77,63,462.90 per dal mill. The total capital investment was more than 19 per cent cost on account of land. The investment in machineries and tiny equipments was the major item of investment followed by buildings and other structures, which individually shared, about 43.32 and 36.14 per cent of the total capital investment cost. The other items of capital investment cost were office furniture and insurance premium, which stood negligible items of investment cost. The per dal mill total capital investment was Rs. 43,11,723.00, Rs. 76,55,497.50 and Rs. 1,19,16,452.00, respectively for the small, medium and large sized dal mills.

Income from pulse processing

All the sample dal mills did the trading business involving the activities of procuring pulse, processing it and selling the finished products such as whole dal, broken dal, chuni and insect infested grains with inert matter to either wholesaler, retailer or final consumers. None of them has performed the job of customers processing by extending pulse processing services to the people in the area during study year. Obviously, the returns occurring to these mills are from the difference between the purchase cost of raw pulse and sale value of its finished products less cost of its processing. At the overall level, the total returns amounted to Rs. 7,87,66,609.75 per dal mill during the year. About 93.24 per cent of the total returns were contributed by the main product whole dal and the remaining 6.76 per cent contribution was made by the value of total by-products. Amongst which, the share of broken dal, chuni and insect infested grains with inert matter in the total returns was 3.58, 2.91 and 0.27 per cent respectively [Table-2].

Among the different size groups of dal mills, the per dal mill total returns amounted to Rs. 3,13,90,151.55, Rs. 8,40,96,796.35 and Rs. 13,49,11,203.80 respectively for small, medium and large sized dal mills during the year. The per dal mill total returns accrued from the sale of whole dal, broken dal, chuni and insect infested grains with inert matter showed an increasing trend over the size groups of dal mills. However, the proportionate shares of the value of whole dal and broken dal in the total returns went on decreasing with the increase in the size of dal mill, Whereas those of chuni and insect infested grains with inert matter increased over the size groups of dal mills.

Table-1 *Capital investment* (Figures in Rs.)

Size groups	Items of capital investment					Total investment
	Land	Buildings & other structures	Machineries & tiny equipments	Office furniture	Insurance	
Small	919259.48 (21.32)	1525487.82 (35.38)	1792383.52 (41.57)	41392.55 (0.96)	33200.27 (0.77)	4311723.60 (100.00)
Medium	1482869.87 (19.37)	2762103.50 (36.08)	3299519.43 (43.10)	50526.28 (0.66)	60478.43 (0.79)	7655497.50 (100.00)
Large	1909015.55 (16.02)	4421003.55 (37.10)	5439860.16 (45.65)	47665.81 (0.40)	98906.58 (0.83)	11916452.00 (100.00)
Overall	1413449.94 (19.05)	2826958.03 (36.14)	3414124.08 (43.32)	46471.33 (0.69)	62459.51 (0.79)	7763462.90 (100.00)

(Figures in parentheses indicate percentages to their respective total investments)

Table-2 *Total annual returns of different sized dal mills* (Figures in Rs.)

Sale value of finished products	Size groups			
	Small	Medium	Large	Overall
1. Main product :				
Whole dal	29370269.15 (93.56)	78520464.00 (93.37)	125659156.80 (93.14)	73445537.98 (93.24)
2. By-product :				
a) Broken dal	1142476.00 (3.64)	3003493.50 (3.57)	4383881.80 (3.47)	2819065.21 (3.58)
b) Chuni	797023.65 (2.54)	2340958.55 (2.78)	4186891.87 (3.10)	2288160.94 (2.91)
c) Insect infested grains and inert matter	80382.75 (0.26)	231880.30 (0.27)	381273.32 (0.28)	213845.62 (0.27
Total (a+b+c)	2019882.40 (6.43)	5576332.35 (6.63)	9252046.99 (6.86)	5321071.77 (6.76)
3. Total returns	31390151.55 (100.00)	84096796.35 (100.00)	134911203.80 (100.00)	78766609.75 (100.00)
4. Less cost of raw pulses purchased	27428738.40 (87.38)	71983998.00 (85.60)	111426430.10 (82.59)	68771872.46 (87.31)
5. Gross returns	3961413.15 (12.62)	12112798.35 (14.40)	23484773.74 (17.41)	9994737.28 (12.69)
6. Less cost of pulses processing	1867129.35 (5.95)	3651447.57 (4.34)	5578736.84 (4.13)	3605122.97 (4.58)
7. Net returns	2094283.80 (6.67)	8461350.78 (10.06)	17906036.90 (13.27)	6389614.31 (8.11)

(Figures in parentheses indicate the percentages to their respective total returns)

Profitability of dal mills

The estimates of the per dal mill annual returns over total variable cost and total cost thus computed [Table-3] for different size groups of dal mills along with their annual operating costs and gross returns. At the overall level, the per dal mill net returns over total variable cost worked out to Rs. 77,27,688.52 and that over total cost came to Rs. 63,89,614.31 during the year. Among the different size groups of dal mill, the per dal mill net returns over total variable cost in the case of small, medium and large sized dal mills amounted to Rs. 28,41,135.54, Rs. 97,79,562.90, and Rs. 1,99,57,043.09, respectively. Similarly, the per dal mill net returns over total cost amounted to Rs. 20,94,283.80, Rs. 84,61,350.78 and Rs. 17,90,6,036.90 for small, medium and large sized dal mills, respectively. From the above discussion it is clear that the magnitudes of the profitability of pulse processing was closely associated with the installed capacity and its utilization in the case of different sized of dal mills.In the case of small sized dal mills, the per dal mill net returns over total variable cost and over total cost were comparatively much lower than the medium and large sized dal mills. To be able to judge relative efficiency of deriving profits from pulse processing, per q gross returns and per q net returns over total variable cost [Table-4].

At the overall level, the per q net returns over total variable cost estimated to Rs. 415.62 and that over total cost came to Rs. 343.66. Among the different size groups of dal mills, the per q net returns over total variable cost in the case of small, medium and large sized dal mills amounted to Rs. 391.54, Rs. 498.47 and Rs. 651.72, respectively. Likewise, the per q net returns over total cost amounted to Rs. 288.62, Rs. 431.28 and Rs. 584.74 for small, medium and large sized dal mills, respectively. The lower costs of pulse processing by large sized dal mills were due to economies of scale. The hypothesis proposed in the chapter entitled "Introduction" that the profits of the larged sized dal mills are comparatively higher than those of the small sized dal mills and expanding the size of the dal mill and scale of pulse processing tend to reduce the unit cost of pulse processing have been proved. Similar results were also reported by [2, 3, 5 & 6].

Table-3 *Total annual operating cost, gross and net returns from pulse processing*

(Figures in Rs.)

Resources	Size groups			Overall
	Small	Medium	Large	
Gross returns	3961413.15	12112798.35	23484773.74	9994737.28
Fixed cost	746851.74	1318212.12	2051006.19	1338074.21
Variable cost	1120277.61	2333235.45	3527730.65	2267048.76
Total cost	1867129.35	3651447.57	5578736.84	3605122.97
Net returns over total variable cost	2841135.54	9779562.90	19957043.09	7727688.52
Net returns over total cost	2094283.80	8461350.78	17906036.90	6389614.31

Table-4 *Economics of pulse processing*

(Rs./q)

Resources	Size groups			Overall
	Small	Medium	Large	
Fixed cost	102.92	67.19	66.97	71.97
Variable cost	154.39	118.93	115.2	121.93
Total cost	257.31	186.12	182.18	193.90
Gross returns	545.93	617.40	766.93	537.55
Net returns over total variable cost	391.54	498.47	651.72	415.62
Net returns over total cost	288.62	431.28	584.74	343.66

Relative economic efficiency of dal mills

Estimation of break-even point:

The break-even point shows the minimum size of operation required to justify economic feasibility of a particular business or purchase of particular machinery. To be more specific, the break-even quantity of pulse processing is the one at which total revenue equalizes total cost for average dal mills from individual size groups of sample dal mills [Table-5].The per dal mill break-even quantity of pulse was less than the actual quantity processed by the all sized groups dal mills. For small, medium and large sized dal mills, the break-even quantity of pulse was 26.29 per cent, 13.48 per cent, 10.28 percent and 17.31 per cent of the actual quantity processed by these mills, respectively. The estimated break-even quantity increased with the increase in the size of dal mills, which was obviously related to their installed capacity. All the size groups of dal mills no doubt operate at a level higher than their break-even quantity but at a level lower than their intake capacity due to inadequate availability of raw material for processing. Similar results were reported by [1 & 4].

Table-5 *Break-even analysis*

Size groups	Break-even volume (q)	Actual quantity processed (q)	Percentage of break-even volume to actual quantity processed
Small	1907.47	7256.29	26.29
Medium	2644.51	19619.14	13.48
Large	3147.05	30621.93	10.28
Overall	3219.43	18592.98	17.31

Estimation of Benefit-Cost Ratio

At the overall level, the benefit-cost ratio in pulse processing worked out to 1.09. Among the different size groups of dal mills, the benefit-cost ratio was estimated at 1.07, 1.11 and 1.15 for the small, medium and large sized dal mills, respectively. Thus, the Benefit-Cost ratio was lower in the case of small sized dal mills than medium and large sized dal mills. It is due to that the purchase of raw pulse and sale of its finished products made by small sized dal mills was mostly at nearby markets [Table-6].

Table-6 *Benefit-Cost ratio of dal mills*

Size groups	Total cost/q	Total returns/q	Net benefit-cost ratio
Small	4037.31	4325.92	1.07
Medium	3855.19	4286.47	1.11
Large	3820.96	4405.70	1.15
Overall	3892.70	4236.36	1.09

Conclusions

The profitability of pulse processing was closely associated with the installed capacity and its utilization in the case of the different sized dal mills. It is, thus, true that the per dal mill net returns over total variable cost as well as over total cost were increased with the increase in the size of dal mills. The estimated break-even quantity increased with the increase in the size of dal mills, which was obviously related to their installed capacity. The Benefit-Cost Ratio was little lower in the case of the small sized dal mills than that of the medium and large sized dal mills.

Conflict of Interest: None declared

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