A STUDY OF COSTS AND RETURNS FOR RAPESEED-MUSTARD ON THE SAMPLE FARMS OF BHARATPUR DISTRICT OF RAJASTHAN

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ABSTRACT

The study was undertaken to work out the costs and returns of rapeseed-mustard for Bharatpur district of Rajasthan on per hectare basis for different categories of farmers by using CACP cost concept. Study was mainly based on the primary data, which were collected through survey method from selected sample respondents (36 small, 15 medium and 9 large) for the agricultural year 2009-10. The results indicated that production of rapeseed-mustard was profitable as reflected through its net returns. The per hectare net return over total cost were Rs. 4408, 3964 and 2198 on small, medium and large farms respectively. It was found that per hectare productivity of rapeseed-mustard was marginally higher (12.88 quintals) on small farms compared to medium (12.72 quintals) and large farms (12.52 quintals), due to better care and management of crop on account of small area under it.

Key words: Costs, CACP cost concept, Gross returns, Net returns

INTRODUCTION

India is the largest producer of oilseeds in the world and oilseed crops occupies an important place in the farming system of the country. India is the fifth largest vegetable oil economy, next to USA, China, Brazil and Argentina, and has an annual turnover of about Rs. 80,000 crore. India accounts for 6-7 per cent of the vegetable oils production, 12-15 per cent of global oilseeds area, and 9-10 per cent of the total edible oils consumption (USDA 2010). The growth in the domestic production of oilseeds has not been able to keep pace with the growth in the demand. The edible oil consumption is continuously rising and has touched 14.2 kg/head/year which is still lower than the world average consumption of 24 kg/head/year during 2010-11. According to an estimate of NCAER, the per capita consumption of the edible oils by the year 2014-15 is likely to be 18.16 kg/head/year, if per capita income grows by 5% which will be equivalent to the oil demand of 25.9 Mt. Thus situation of edible oil availability is expected to be more precarious in the years to come. The country now imports nearly half of the annual consumption of 168 Mt. Edible oil imports increased from around 15 per cent of total edible oils consumption in 1995-96 to nearly 53 per cent in 2009-10. However, increasing demand for edible oils necessitated the imports in large quantities leading to a substantial drain on foreign exchange. This necessitates paying attention for increasing oilseeds production in the country. The demand and supply gap in the edible oil had increased significantly and is increasing continuously. This gap in demand and supply caused steep rise in prices which has further taken away consumption of the edible oil from the economic limit of the masses in the country.

Besides the nine oilseeds crops soybean, rapeseed- mustard and groundnut are major oilseed crops, account for about 80 per cent of area and 87 per cent production of oilseeds in the country (2010-11). Rapeseed- mustard was selected for study which is second largest oilseed crop after soybean. It is grown almost all over the India in different ecosystems and cropping sequences. Unlike wheat, barley and other rabi crops, water

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requirement for rapeseed-mustard is less. However, its main area is confined to northwestern and central part of India. Four states viz., Rajasthan, Uttar Pradesh, Haryana and Madhya Pradesh accounts for nearly 78% of acreage and 80% of the total production under rapeseed-mustard. Rajasthan has occupied a prime position among the states and accounts for 40.83% of acreage and 38.61% of total production of rapeseed-mustard. This crop finds important place in the cropping scheme of farmers of almost all the districts of Rajasthan. Out of 32 districts in Rajasthan, Bharatpur district occupies first place in rapeseed-mustard production. Interestingly the cropping pattern in the state has undergone changes. In terms of area, the relative importance of rapeseed-mustard has increased in 2008-09 as compared to 1985-86. In Rajasthan during 1985-86 the rapeseed-mustard was in fourth place in terms of area whereas it occupied the second place in 2008-09.

Keeping in view the increasing importance of rapeseed-mustard in the cropping scheme of farmers of Rajasthan in general and farmers of Bharatpur district in particular it appears pertinent and quite imperative to study economics of this crop and its contribution in the farmer’s income.

MATERIALS AND METHODS

Sampling design: Bharatpur region was selected purposively based on its first rank in area (929438 ha) and production (1123340 tonnes) of rapeseed-mustard in the state which was 25.61% of its total production. Bharatpur region consisted five districts namely: Alwar, Bharatpur, Dholpur, Karauli, Swai Madhopur, out of which Bharatpur District was selected purposively (On the basis of highest area under rapeseed-mustard). From the District, one development block (Bayana) was selected, out of which four villages namely Barinpura, Tarsuma, Bedpur and Naroli were selected randomly for the study.

A complete enumeration of all the farmers of four selected villages was made along with their operational size of holding. In order to determine the small, medium and large farmers from view point of rapeseed-mustard growers, a cumulative total of the operational size of holdings of the farmers of the four villages was worked out. Then cumulative total of operational holdings was demarcated into three equal parts in order to classify them into small, medium and large size groups from view point of rapeseed-mustard cultivation. From all four villages 30 farmers were selected in probability proportion to their numbers from all the three size groups.

Table 1 shows the classification of farmers as small (<2.60 ha), medium (≥ 2.60 to ≤ 5.07 ha) and large (> 5.07 ha) based on size of land holding. The total number of respondents selected was 30, comprising of 60 per cent small, 27 per cent medium, and 13 per cent large farmers.

Data, its sources and analytical procedures: The present study was mainly based on the primary data which were collected through survey method from selected sample respondent for the agricultural year 2009-10. CACP cost concept was used to work out the costs and returns on per hectare basis of rapeseed-mustard crop for different categories of farmers. There are many empirical studies on the costs and returns of oilseeds and pulses, which may be referred to for details (Naidu, and Gupta et al. 1989; Singh and Khan, 1993; Burman, et al. 2005; Singh, et al. 2005).

CACP Cost Concept: Cost A₁: All variable cost excluding family labour cost and including depreciation
Cost A₂: Cost A₁ + Rent paid for leased-in land

<table>
<thead>
<tr>
<th>Size group of farmers</th>
<th>Villages</th>
<th>Total farmers</th>
<th>Selected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>V1</td>
<td>V2</td>
<td>V3</td>
</tr>
<tr>
<td>Small (&lt; 2.60 hectare)</td>
<td>6</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Medium (≥ 2.60 ≤ 5.07ha)</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Large (&gt; 5.07 hectare)</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Overall</td>
<td>9</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

Note: The criteria for selection of rapeseed-mustard growers was that they must have area under rapeseed-mustard above one acre (0.4 ha)
Cost \( B_1 \): \( \text{Cost } A_1 + \text{Imputed interest on the value of owned capital assets (excluding land)} \)

Cost \( B_2 \): \( \text{Cost } B_1 + \text{Imputed rental value of owned land (Net of land revenue)} + \text{rent paid for leased-in land} \)

Cost \( C_1 \): \( \text{Cost } B_1 + \text{Imputed value of family labour} \)

Cost \( C_2 \): \( \text{Cost } B_2 + \text{Imputed value of family labour} \)

Cost \( C_2^* \): \( \text{Cost } C_2^* \) will be estimated by taking into account statutory minimum or actual wage rate whichever is higher.

Cost \( D \): \( \text{Cost } C_2^* + 10\% \text{ of cost } C_2^* \text{ for managerial function performed by farmer} \)

Note: If there is no case of leased-in land then cost \( A_1 \) will be the same as cost \( A_2 \).

Gross and Net returns: Gross returns were computed on the basis of actual prices at which individual farmers sold their main products and by products. Where only a part of the output was sold, the unsold output was valued at the rate at which a part of the output was sold. In the case of output not sold at all, model prices that prevailed during the season at the regulated market were used for evaluation. These model prices were ascertained from the Agricultural Product Market Committee (APMC) of the tehsils to which the farmers belonged. For calculating the net returns on per hectare basis total cost was deducted from gross returns.

RESULTS AND DISCUSSION

A detailed picture of costs and returns as found on the selected sample farms in case of rapeseed-mustard is presented in the Table 2 and discussed below.

(A) Operational costs: The cost of human and bullock labour constituted the most important components of operational cost. Out of total human labour cost, cost of hired human labour was substantially higher on all categories of farms i.e. small, medium and large farms. The per hectare cost of hired labour as on overall was Rs. 1360 and on small, medium and large farms was Rs. 1249, 1470 and 1639 respectively, where as the value of family labour as on overall was Rs. 752 and for respective farm sizes were Rs. 800, 712 and 615. Out of total operational costs, the maximum share was of bullock labour. The reason attributable to this fact was that land preparation and other intercultural operations were performed with the help of bullocks which raised the level of bullock labour costs. The per hectare bullock labour costs as on overall was Rs. 1672 and on small, medium and large farms bullock labour costs were Rs. 1512, 1910 and 1917 respectively which in terms of percentage constituted 6.03, 7.48 and 7.07 per cent of the total operational cost.

However, share of operational cost in total costs were 20.09, 19.49, 21.03 and 20.79 percent on overall, small, medium and large farms respectively.

(B) Material costs: Material cost was the major costs in the total cost of production of rapeseed-mustard. It is also seen that study area being dry area, the cost of irrigation was not a component of the material costs. The main expenditure made in material cost was on manures and fertilizers, followed by expenditure on plant protection measures. In fact, the rapeseed-mustard was susceptible to insect, pests and diseases in the study area, hence in order to protect the crop farmers were compelled to make heavy expenditure on plant protection measures. The per hectare expenditure made on plant protection measures were Rs. 2512, 2394, 2779 and 2516 on small, medium, large and overall size groups of farms respectively. The use of fertilizers was much dependent on rainfall. Farmers pointed out that the use of fertilizers was made in more quantities only when rainfall was there. Luckily during the year of survey (2009-10), the rainfall was good; hence farmers had used more quantities of fertilizers. As a consequence, expenditure on manures and fertilizers was observed to constitute 25.60, 24.00, 24.61 and 25.03 per cent of the total cost on small, medium and large farms and overall size groups of farms respectively.

(C) Fixed costs: As reflected through the value of fixed cost for different size of farms, it was found that rental value of land constituted more than 19 per cent of the total cost. However, total fixed cost ranged between 22.59 to 24.14 per cent of the total cost on all the three categories of farms. The rental value of land prevalent in the study area was rupees 5000 per hectare for a crop season (3 month). The total costs of production i.e. Cost \( D \) (which included the managerial cost of farmers) per hectare on small, medium, large and overall size of farms were Rs. 25,081, 25,535, 27,116 and 25,473 respectively.

Comparison of costs based on CACP concept: Cost \( A_1 \), which is also called as out of pocket expenses (cash expenses) was Rs. 13,963 per hectare for
TABLE 2: Per hectare costs and returns of rapeseed-mustard production (in Rupees)

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average size of farm (ha)</td>
<td>1.56</td>
<td>4.04</td>
<td>12.31</td>
<td>3.79</td>
</tr>
<tr>
<td>Area under rapeseed-mustard (ha)</td>
<td>1.35</td>
<td>3.96</td>
<td>6.62</td>
<td>2.79</td>
</tr>
</tbody>
</table>

A. Operational cost

1. Human labour
   a) Owned
      (3.19)  
   b) Hired
      (4.98)  

2. Bullock pair
   (6.03)  

3. Machinery
   (6.03)  

4. Miscellaneous charges
   (1.03)  

5. Interest on working capital
   (1.03)  

Sub Total
   (19.49)  

B. Material cost

1. Seed
   (1.33)  

2. Fertilizers and manure
   (25.60)  

3. Plant protection chemicals
   (10.02)  

Sub Total
   (39.64)  

C. Fixed cost

1. Rental value of owned land
   (19.94)  

2. Depreciation on capital investment in fixed asset
   (1.52)  

3. Interest on capital investment in fixed asset
   (2.59)  

4. Land revenue paid to Government
   (0.10)  

Sub Total
   (24.14)  

Grand total (A+B+C)
   (80.58)  

<table>
<thead>
<tr>
<th>Cost</th>
<th>1</th>
<th>2</th>
<th>1</th>
<th>2</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>CostA 1</td>
<td>13761.00</td>
<td>13859.00</td>
<td>15077.00</td>
<td>13963.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CostA 2</td>
<td>13761.00</td>
<td>13859.00</td>
<td>15077.00</td>
<td>13963.00</td>
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<td></td>
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<tr>
<td>CostB 1</td>
<td>14410.00</td>
<td>14514.00</td>
<td>15733.00</td>
<td>15414.00</td>
<td></td>
<td></td>
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<tr>
<td>CostB 2*</td>
<td>19385.00</td>
<td>19489.00</td>
<td>20708.00</td>
<td>19589.00</td>
<td></td>
<td></td>
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<tr>
<td>CostC 1</td>
<td>15210.00</td>
<td>15314.00</td>
<td>16533.00</td>
<td>15414.00</td>
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<td></td>
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<tr>
<td>CostC 2</td>
<td>20185.00</td>
<td>20289.00</td>
<td>21508.00</td>
<td>20389.00</td>
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<td></td>
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<tr>
<td>CostD 1</td>
<td>22801.00</td>
<td>23214.00</td>
<td>24651.00</td>
<td>23486.00</td>
<td></td>
<td></td>
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<tr>
<td>CostD 2</td>
<td>25081.00</td>
<td>25535.00</td>
<td>27116.00</td>
<td>25473.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Return from main product (Rs)
   28465  

Contt........................
Return from by product (Rs)  1024  1006  994  1015
Gross return (Rs)  29489  29499  29314  29468
Net return over (Rs)  4408  3964  2198  3995
a) Cost A₁ (Farm business income)  15728  15640  14237  15506
b) Cost A₂  15728  15640  14237  15506
c) Cost B₁ (Family labour income)  15079  14985  13581  14854
d) Cost B₂  10104  10010  8606  9879
e) Cost C₁  14279  14185  12781  14054
f) Cost C₂  9304  9210  7806  9079
g) Cost C₂*  6688  6285  4663  6310
h) Cost D  4408  3964  2198  3995

Note: 1: Figures in the parentheses are percentage to total cost D.  
2: The figures w.r.t. costs and returns have been rounded off to nearest rupee.

Per hectare gross and net returns from rapeseed-mustard on different size of farms:
Table 2 revealed that per hectare gross returns for rapeseed-mustard on small, medium and large farms were found to be Rs. 29,489, 29,499 and 29,468 respectively. The trend of inverse relationship was observed between per hectare gross and net returns and operational size of holding. However, per hectare productivity of rapeseed-mustard was marginally higher (12.88 quintals) on small farms compared to medium (12.72 quintals) and large farms (12.52 quintals), due to better care and management of crop on account of small area under it. The production of rapeseed-mustard was profitable as reflected through its net returns. It was found that per hectare productivity of rapeseed-mustard was marginally higher (12.88 quintals) on small farms compared to medium (12.72 quintals) and large farms (12.52 quintals), due to better care and management of crop on account of small area under it. The trend of inverse relationship was observed between net returns and land holdings for the given area was due to management factor.

Per hectare gross and net returns from rapeseed-mustard on different size of farms:
As far as the case of Cost C₁ and Cost C₂ was concerned, it was found that in terms of per hectare; these two costs were almost same for small and medium categories of farms. The reason for such situation was that the magnitude of per hectare family labour cost was higher for small farms compared to medium farms.

CONCLUSION
In the study area rapeseed-mustard cultivation was being given top priority by the Government. It was found that out of net cultivated area, the average area allocated under rapeseed-mustard were 1.35, 3.96, 6.62 and 2.79 hectare on small, medium, large and overall size group of farms respectively. The production of rapeseed-mustard was profitable as reflected through its net returns. It was found that per hectare productivity of rapeseed-mustard was marginally higher (12.88 quintals) on small farms compared to medium (12.72 quintals) and large farms (12.52 quintals), due to better care and management of crop on account of small area under it. The trend of inverse relationship was observed between net returns and land holdings for the given area was due to management factor. However, farmers do not find any other better alternative crops to replace rapeseed-mustard, hence were observed to continue with it. The other convincing reason for continuous cultivation of rapeseed-mustard by farmers was physical factors suitting to raise this crop. The current level of rapeseed-mustard production and the prevailing trends in the area, production and productivity of rapeseed-mustard oils availability in the country are way below the requirements. This scenario needs to be reversed if the country has to achieve self-sufficiency in rapeseed-mustard production and reduce our dependence on imports of edible oils. The major avenues for future increases in rapeseed-mustard production are expected to come from enhancement in productivity of this crop. To realize this expectation, a proper mix of technologies and strategies needs to be put in place.

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