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An economic analysis of mustard-rapeseed cultivation in district Prayagraj of Uttar Pradesh

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Abstract

The present study is based on an economic analysis of mustard-rapeseed production with the objective of determining income and expenditure in the Prayagraj District of Uttar Pradesh. The collection of primary data was done on different factors with the help of the survey method for the agricultural season of 2021–2022. A total of 240 mustard-rapeseed farmers from 12 villages were selected from the Jasra and Soraon blocks of Prayagraj District. The major findings of the study show that Rs. 23722.10/hectare, 14.04 quintals, Rs. 1689.30, and 1: 1.77 are the overall costs of cultivation, yield, cost of production, and benefit cost ratio, respectively.

Keywords: Mustard, cost of cultivation, economic analysis, Prayagraj

Introduction

India is the 3rd largest mustard-rapeseed producer in the world, with 12% of total production. With it being the country's main edible oilseed crop, the mustard-rapeseed crop accounts for approximately one-third of the oil produced in our country, so India has to re-categorize the import of edible oils. Because of the gap between domestic availability and actual consumption of oils, Mustard-rapeseed is the prime source of income, livelihood, and employment, especially for the small and marginal farmers in rainfed zones. Since these crops are grown mainly in rainfed and input-scarce areas of the country, their impact on income and employment security for the small and marginal farmers in these areas is also very significant. By increasing local production, substantial import exchange can be achieved. Due to its requirement of low water, mustard-rapeseed crops fit fine in the rainfed cropping system.

The area under Mustard cultivation in Uttar Pradesh is on fourth, 0.75 mh. 12.08 per cent of total area of Mustard in India. Haryana is on second, cultivating on 0.61 mh. (9.78 per cent), and third states is Madhya Pradesh 0.78 mh. (12.49 per cent). Let's talk about production of Mustard in Uttar Pradesh is on third with 1.12 mt. 11.96 per cent of total production in India, whereas Rajasthan is on top with 4.08 mt. (43.69 per cent), Haryana is on second with 1.25 mt. (13.42 per cent). Productivity of these states is Uttar Pradesh 1483 Kg/Hectare, Rajasthan 1720 Kg/Hectare, Haryana 2058 Kg/hectare. (Source: Directorate of Economics & Statistics, DAC&FW).

Materials and Methods

The collection of primary data was done on different factors with the help of the survey method for the agricultural season of 2021–2022. A total of 240 mustard-rapeseed farmers from 12 villages were selected from two blocks, namely Jasra and Soraon, from Prayagraj District.

The farmers were classified into the following land size groups i.e.

1. Marginal Farmers blow 1 hectare.
2. Small Farmers 1-2 hectares.
3. Semi-Medium Farmers 2-4 hectares.
4. Medium Farmers 4-10 hectares.

To work out the cost of cultivation, the standard method was adopted, which includes costs A, B, and C. Income measures including farm business income, family labor income, net income, farm investment income, and B-C ratio were calculated with the help of their respective formulas.

Results and Discussion

Cost of cultivation of Mustard-rapeseed

The component-wise various costs incurred in the cultivation of

mustard-rapeseed are given in Table 1. It shows that the overall cost of cultivation of mustard rapeseed was Rs. 23722.10. The total operational cost, including family labor, hired labor, machinery labor, and transportation costs, was Rs. 7626.75/ha. The material cost includes seed, manure, fertilizer, irrigation, and Plant protection accounted for Rs. 5631.99/ha, and other costs, including interest on working capital, depreciation, land revenue, interest on fixed capital, and rental value of own land, were calculated at Rs. 8306.80/ha.

Table 1: Cost of cultivation of Mustard crop. (Rs./ha), (Total Respondents=240)

| Variable cost | | | | | |
|---|-----------------------|-------------------|-------------------|-------------------|-------------------|
| (A)-Operational cost | Category of farm size | | | | |
| | Marginal | Small | Semi- Medium | Medium | Over all |
| Family labour | 2048 (8.46) | 1792 (7.48) | 1536 (6.50) | 869 (3.79) | 1561.25 (6.58) |
| Hired labour | 512 (2.11) | 768 (3.21) | 1024 (4.33) | 1664 (7.25) | 992 (4.18) |
| Machinery labour | 4498 (18.58) | 4398 (18.36) | 4298 (18.19) | 4276 (18.63) | 4398 (18.54) |
| Transportation cost | 742 (3.06) | 730 (3.05) | 710 (3.00) | 520 (2.27) | 675.5 (2.85) |
| Sub total (A) | 7800 (32.22) | 7688 (32.09) | 7568 (32.03) | 7329(31.93) | 7626.75 (32.15) |
| (B)- Material cost | | | | | |
| Seed | 798 (3.30) | 783 (3.27) | 770 (3.26) | 710 (3.09) | 765.25 (3.23) |
| Manure & fertilizer | 2974 (12.28) | 2931 (12.23) | 2841 (12.02) | 2640 (11.50) | 2846.5 (12.00) |
| Irrigation | 1689 (6.98) | 1621 (6.77) | 1619 (6.85) | 1543 (6.72) | 1618 (6.82) |
| Plant protection | 426.66 (1.76) | 426.66 (1.78) | 405.67 (1.72) | 350 (1.52) | 402.24 (1.70) |
| Sub total (B) | 5887.66 (24.32) | 5761.66 (24.05) | 5635.67 (23.85) | 5243 (22.84) | 5631.99 (23.74) |
| Total variable cost (A+B) | 13687.66 (56.54) | 13449.66 (56.14) | 13203.67 (55.88) | 12572 (54.77) | 13258.74 (55.89) |
| Other cost | | | | | |
| Interest on working capital @7% | 479.06 (1.98) | 470.73 (1.96) | 462.12 (1.96) | 440.02 (1.92) | 464.05 (1.96) |
| Depreciation | 156 (0.64) | 186 (0.78) | 148 (0.63) | 195 (0.85) | 171.25 (0.72) |
| Land revenue | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| Interest on fixed capital | 186 (0.77) | 174 (0.73) | 167 (0.71) | 159 (0.69) | 171.5 (0.72) |
| Rental value of own land | 7500 (30.98) | 7500 (31.30) | 7500 (31.74) | 7500 (32.68) | 7500 (31.62) |
| Sub total (C) | 8321.06 (34.37) | 8330.73 (34.77) | 8277.12 (35.03) | 8294.02 (36.14) | 8306.80 (35.02) |
| Cost c ₂ * total (A+B+C) | 22008.72 (90.91) | 21780.39 (90.91) | 21480.79 (90.91) | 20866.02 (90.91) | 21565.55 (90.91) |
| 10% of c ₂ * for managerial work | 2200.87 (9.09) | 2178.03 (9.09) | 2148.07 (9.09) | 2086.60 (9.09) | 2156.55 (9.09) |
| Cost C ₃ =(C ₂ *+C ₂ *10%) | 24209.60 (100.00) | 23958.43 (100.00) | 23628.87 (100.00) | 22952.62 (100.00) | 23722.10 (100.00) |

(Source: Survey Data), (Figures in brackets are percentages of the total.)

Cost concept wise cost of Mustard crop on various sized farms groups

As per the Commission of Agricultural Cost and Prices's cost concepts wise cost of cultivation for the mustard rapeseed is presented in Table 2. The table reveals that the overall per hectare cost of A1 was Rs. 12332,80. It has been found that cost A1 is increasing, then decreasing, and again increasing, the same repetition we can see in cases A2, B1, and B2. But in the case of

Cost C1, it has been observed as decrease with increasing land size. The cost C2 and cost C2* were the same for all the land holding size groups. Per hectare cost C3 is the total cost of cultivation of the mustard-rapeseed crop, includes the managerial costs of farmers as well. Rather than other categories, the marginal land size group of farmers is spending more on mustard-rapeseed cultivation (Rs 24209.60/ha).

Table 2: Cost concept wise cost of cultivation of Mustard crop (Rs./ha), (Total Respondents=240)

| Particulars | Farm size groups | | | | |
|-----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | Marginal | Small | Semi Medium | Medium | Over all |
| Cost A ₁ | 12274.72 (50.70) | 12314.39 (51.40) | 12277.79 (51.96) | 12338.02 (53.75) | 12332.80 (51.99) |
| Cost A ₂ | 12274.72 (50.70) | 12314.39 (51.40) | 12277.79 (51.96) | 12338.02 (53.75) | 12332.80 (51.99) |
| Cost B ₁ | 12460.72 (51.47) | 12488.39 (52.13) | 12444.79 (52.67) | 12497.02 (54.45) | 12504.30 (52.71) |
| Cost B ₂ | 19960.72 (82.45) | 19988.39 (83.43) | 19944.79 (84.41) | 19997.02 (87.12) | 20004.30 (84.33) |
| Cost C ₁ | 14508.72 (59.93) | 14280.39 (59.60) | 13980.79 (59.17) | 13366.02 (58.23) | 14065.55 (59.29) |
| Cost C ₂ | 22008.72 (90.91) | 21780.39 (90.91) | 21480.79 (90.91) | 20866.02 (90.91) | 21565.55 (90.91) |
| Cost C ₂ * | 22008.72 (90.91) | 21780.39 (90.91) | 21480.79 (90.91) | 20866.02 (90.91) | 21565.55 (90.91) |
| Cost C ₃ | 24209.60 (100.00) | 23958.43 (100.00) | 23628.87 (100.00) | 22952.62 (100.00) | 23722.10 (100.00) |

(Source: Survey Data), (Figures in brackets are percentages of the total)

Cost of production and returns from Mustard crop on various farm size group

The yield of the main product and their prices are expressed in Table 3. The overall yield of the main product of mustard-rapeseed was observed at 14.04 quintals per hectare. The overall

price received by the farmers was Rs. 3000/qlt. The overall gross return from the mustard-rapeseed farm per hectare was estimated at Rs. 42127.5. The overall cost of production and profit margin was calculated as 1689.30 and 1310.69 Rs./qlt.

Table 3: Returns from Mustard on various farm size group, (Total Respondents=240)

| Particulars | Farm size groups | | | | |
|----------------------------------|------------------|----------|-------------|----------|----------|
| | Marginal | Small | Semi-Medium | Medium | Over all |
| Cost of cultivation | | | | | |
| Yield of main product (qtl/ha) | 14.45 | 14.31 | 13.89 | 13.52 | 14.04 |
| Yield of by product (qtl/ha) | 0 | 0 | 0 | 0 | 0 |
| Price of main product (Rs/qtl.) | 3000 | 3000 | 3000 | 3000 | 3000 |
| Price of by product (Rs/qtl.) | 0 | 0 | 0 | 0 | 0 |
| Return of main product (Rs/ha.) | 43350 | 42930 | 41670 | 40560 | 42127.5 |
| Return of by product (Rs/ha.) | 0 | 0 | 0 | 0 | 0 |
| Gross return (Rs/ha.) | 43350 | 42930 | 41670 | 40560 | 42127.5 |
| Return over various costs | | | | | |
| Cost A ₁ | 31075.27 | 30615.60 | 29392.20 | 28221.98 | 29794.69 |
| Cost A ₂ | 31075.27 | 30615.60 | 29392.20 | 28221.98 | 29794.69 |
| Cost B ₁ | 30889.27 | 30441.60 | 29225.20 | 28062.98 | 29623.19 |
| Cost B ₂ | 23389.27 | 22941.60 | 21725.20 | 20562.98 | 22123.19 |
| Cost C ₁ | 28841.27 | 28649.60 | 27689.20 | 27193.98 | 28061.94 |
| Cost C ₂ | 21341.27 | 21149.60 | 20189.20 | 19693.98 | 20561.94 |
| Cost C ₂ * | 21341.27 | 21149.60 | 20189.20 | 19693.98 | 20561.94 |
| Cost C ₃ | 19140.39 | 18971.56 | 18041.12 | 17607.37 | 18405.39 |
| Cost of production (Rs/qtl.) | 1675.40 | 1674.24 | 1701.14 | 1697.67 | 1689.30 |
| Profit margin (Rs/qtl.) | 1324.59 | 1325.75 | 1298.85 | 1302.32 | 1310.69 |

(Source: Survey Data)

Income analysis

Income analysis describes income from mustard-rapeseed on various components viz. farm business income, family labour income, net income, farm investment income and Benefit cost

ratio towards cost which reflect revenue earned by farmer from farm. Table 4 explains that overall Farm Business Income, Net Income, and B C Ratio was calculated as Rs. 29794.69/ha, Rs. 18405.39/ha, and 1: 1.77 respectively.

Table 4: Income analysis, (Total Respondents=240)

| | Marginal | Small | Semi-Medium | Medium | Over all |
|------------------------|----------|----------|-------------|----------|----------|
| Farm Business Income | 31075.27 | 30615.60 | 29392.20 | 28221.98 | 29794.69 |
| Family Labour Income | 23389.27 | 22941.60 | 21725.20 | 20562.98 | 22123.19 |
| Net Income | 19140.39 | 18971.56 | 18041.12 | 17607.37 | 18405.39 |
| Farm Investment Income | 26826.39 | 26645.56 | 25708.12 | 25266.37 | 26076.89 |
| B C Ratio | 1: 1.80 | 1: 1.79 | 1: 1.76 | 1: 1.75 | 1: 1.77 |

(Source: Survey Data)

Summery and Conclusion

The key findings of the study revealed that overall cost of cultivation of mustard-rapeseed was calculated Rs. 23722.10/ha. Among all marginal farm size cultivation is more expensive as Rs. 24209.60/qlt. Talk about the return from mustard-rapeseed production, marginal farm size is more profitable with Rs. 43350/ha. the overall Farm Business Income, Net Income, and B C Ratio was calculated as Rs. 29794.69/ha, Rs. 18405.39/ha, and 1: 1.77 respectively. The per hectare profit obtained by marginal land holding was more than other categories of mustard-rapeseed growers due to effective cultivation practices in the Prayagraj district. It has been clear from the study that if size of farm holding increases the cost of production decreases.

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