

## RESEARCH NOTE

## Economics of Production of Rapeseed and Mustard in Imphal West District of Manipur

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### ABSTRACT

The study was carried out in Imphal West district of Manipur with an objective to calculate the economics of rapeseed and mustard crop. The research is based on the data collected from 100 randomly selected rapeseed and mustard growing farmers. Production is normally considered as the function of area and yield. The decision regarding the choice of the crop enterprise to be taken on the farm and the allocation of area and resources under it depends to a great extent, on level of yield, price of output and the cost of inputs used in the production of that crop. The cost of cultivation and returns to different factors of production help in decision making about the selection of the crop and hence, these measures were worked out for rapeseed and mustard crop. The average cost of cultivation of rapeseed and mustard was Rs. 24208.66 per hectare. Among different components of cost of cultivation, hired human labour accounted for the large portion (28.96 per cent) followed by rental value of owned land (22.44 per cent). The net farm income per hectare was estimated at Rs. 18659.60. The benefit cost ratios per hectare was found to be 1.77.

**Key words:** Cost of cultivation; Rapeseed and mustard; Cost concept;

India is one of the largest producer and consumer of vegetable oils in the world. India is the fourth largest country in the world next to USA, China and Brazil in vegetable oil economy. Next to food grains, oilseeds play the second most important role in area and production in the Indian agricultural economy. The area, production and productivity of Rapeseed and Mustard in the world during the year 2018-2019 was 36.54 million hectares, 72.80 million metric tonnes and 1.99 metric tons / hectare, respectively (USDA, 2019). In India, Rajasthan, Uttar Pradesh, Madhya Pradesh, Haryana and Gujarat are the highest sown states accounting for about more than 70 per cent of total mustard acreage in the country. India accounted for about 7.20 million hectares, 8.00 million metric tons, 1.11 metric tons / hectare of total area, production and productivity respectively in the year 2018-2019 (USDA, 2019). Among *rabi* oilseed, rapeseed and mustard plays an important role in North (NEH) Eastern Hill region. Rapeseed and mustard occupies the most important

position as edible oilseed crop in Manipur. It has a production of 24.8 million ton with an area of 29.13 thousand hectares and the yield of 7.63 million ton / hectare (DoA, GoM, 2019). In Manipur, it is mainly cultivated for oil as well as a vegetable. Due to uncertainty of rain and lack of irrigation facilities, farmers are unwilling to grow *rabi* crops except in some irrigated areas and major part of the state rests fallow after rice from November to June. Since zero tillage technology benefits in saving water, fuel, ensure timely saving and reduce drudgery of work (Grover and Sharma, 2011), cultivation of rapeseed and mustard under zero tillage has become common in Manipur and this practice is followed on nearly 2.83 thousand ha during *rabi* season, 2018-2019 in Imphal West District of Manipur (DoA, GoM, 2018-19).

It has been explored that there is a great potential of conservation agriculture through resource conservation technologies (RCT's) in Manipur where majority of farmers are small and marginal, adoption of

RCT's practices in cultivation of crops would certainly improve sustainability in agriculture without disrupting biological natural processes (Devi, 2012). Moreover, along with conservation agriculture, crop diversification proved to be of paramount importance in mitigating the environmental problems arising on account of monoculture. Inclusion of certain crops in the sequence has been found to reduce weeds; nitrate leaching and increased fertilizer use efficiency. Monika (2014) stated that a vast area of Manipur had lead to the transformation of mono-cropped rice cropping system to double cropped rice- rapeseed and mustard zero tillage cropping system where zero tillage technology denotes for a special technique of establishing crops without tillage and seedbed preparation. Zero tillage not only promotes input use efficiency but also strengthens natural resource base (Laxmi and Mishra, 2007). Timely sowing under zero tillage improves crop yields and thus provides resilience against drought and other hazards (Mehla et al., 2000). It provides higher profitability to the farmers mainly due to saving in cost of tillage operations (Malik et al., 2005) and long term studies that have been established in Haryana have also shown that so far that zero tillage has maintained a positive balance and is not likely to pose any problem in the long run (Yadav et al., 2005).

## METHODOLOGY

The period of enquiry was related to the agriculture year 2018-19. The study was conducted in Imphal West district of Manipur. A three stage sampling design was employed. In the first stage, Lamsang and Wangoi block were selected for the study using simple random sampling technique. At the second stage six villages viz. Haorangsabal, Sanjenbam, Lairenkabi, Kachikhul and Sangaitel from Lamsang Block and Monsangei village from Wangoi Block were selected randomly. In the final stage, from the prepared list, using random sampling technique a total of 100 respondent farmers were drawn for collection of relevant data and information with respect to Rapeseed and Mustard crop. Both primary and secondary data was collected for analysis and interpretation. The primary data was collected on pre-tested schedule by adopting personal interview method from 100 respondents. Based on the data collected the cost of and returns and profitability were worked out using different cost concepts viz., Cost A<sub>1</sub>, Cost

A<sub>2</sub>, Cost B<sub>1</sub>, Cost B<sub>2</sub>, Cost C<sub>1</sub>, Cost C<sub>2</sub> and Cost C<sub>3</sub>. For the purpose of analyzing the returns from rapeseed and mustard crop, various types of farm income were worked out which includes gross income, net income, farm business income, family labour income, farm investment income, returns to management and net return over total variable cost. The benefit cost ratio was also worked out.

*Cost concept* : The different cost components used in the analysis were as follows.

*Variable cost* : It includes labour cost, seed cost, fertilizer cost, plant protection chemical cost, irrigation cost and interest on working capital.

*Fixed cost*: It includes interest on fixed capital, land revenue and other taxes, rental value of owned land and depreciation on farm implements and farm buildings

Cost A<sub>1</sub> = includes Value of seed, Value of fertilizer, Value of Plant protection chemical, Value of human labour, Irrigation charges, Depreciation on farm implements, Interest on working capital, Land revenue and Other expenses

Cost A<sub>2</sub> : Cost A<sub>1</sub> + Rent paid for leased-in land

Cost B<sub>1</sub> : Cost + interest on value of owned fixed capital assets (excluding land)

Cost : Cost + rental value of owned land (net of land revenue) and rent paid for leased-in land.

Cost<sub>1</sub> : Cost B<sub>1</sub> + imputed value of family labour

Cost C<sub>2</sub> : Cost B<sub>2</sub> + imputed value of family labour

Cost C<sub>3</sub> : Cost C<sub>2</sub> + 10 per cent of cost C<sub>2</sub> as management cost

*Return analysis*: The following types of farm income were considered for analyzing the returns from rapeseed and mustard crop

Gross income (GI) = Total value of main product = (Quantity of main product X price of main product)

Returns over variable cost = Gross income – cost

Farm business income = Gross income – cost

Family labour income = Gross income – cost B<sub>2</sub>

Net income = Gross income – cost C<sub>2</sub>

Returns to Management = Gross income – cost C<sub>3</sub>

Farm investment income = Farm business income- imputed value of family labor

Benefit cost ratio = Gross income/ cost C<sub>2</sub>

## RESULTS AND DISCUSSION

The present study aimed to work out the cost and return of rapeseed and mustard crop adopted by the respondent farmers in two blocks of Imphal West district of Manipur. The costs per hectare incurred in cultivation of sample farms are presented in Table 1. The average cost of cultivation worked out to Rs. 24208.66 per hectare. A perusal of the table reveals that out of total

**Table 1. Cost of cultivation of rapeseed and mustard/ha basis**

Particulars/	Rs./ha
Seed	1418.25 (5.86)
Fertilizer	3043.39 (12.57)
Plant protection chemical	851.06 (3.52)
Irrigation	797.97 (3.30)
Labour	7010.28 (28.96)
Imputed value of family labour	3010.27(12.43)
Land Revenue	145 (0.60)
Dep. on farm implements & farm building	593.33 (2.45)
Rental value of owned land	5431.28 (22.44)
Interest on working capital	1004.32 (4.15)
Interest on fixed capital	903.49 (3.73)
Total variable cost	14125.27 (58.34)
Total Fixed Cost	10,083.39 (41.65)
Total Cost(TVC+TFC)	24208.66 (100)
Cost A <sub>1</sub>	14863.60
Cost A <sub>2</sub>	14863.60
Cost B <sub>1</sub>	15767.09
Cost B <sub>2</sub>	21198.37
Cost C <sub>1</sub>	18777.37
Cost C <sub>2</sub>	24208.65
Cost C <sub>3</sub>	26629.52

**Table 2. Returns of rapeseed and mustard/ha basis**

Particulars	Rs./ha
Gross Income	42868.25
Net Income	18659.60
Family Labour Income	21669.88
Farm Business Income	28004.65
Farm Investment Income	24994.37
Net Returns Over Variable Cost	28004.65
Returns to Management	40447.39
Returns per rupee	1.77

cost of cultivation, hired human labour charges were the major cost item. It accounted for about 28.96 per cent of the total cost of cultivation. The rental value of owned land were the next important cost component contributing about 22.44 per cent of the total cost of cultivation.

Apart from variable inputs, hired human labours, the other variable inputs were seed, fertilizers, plant protection chemicals, irrigation and interest on working capital which constitutes 5.86, 12.57, 3.52, 3.30 and 4.15 per cents respectively. The fixed costs were depreciation cost, land revenue, interest on fixed capital and imputed value of family labour which constitutes 2.45, 0.60, 3.73 and 12.43 per cents respectively.

The costs related to rapeseed and mustard production are split up into various components such as Cost A<sub>1</sub>, Cost A<sub>2</sub>, CostB<sub>1</sub>, Cost B<sub>2</sub>, CostC<sub>1</sub>, CostC<sub>2</sub>, Cost C<sub>3</sub>, which was used to derived different income measures. Since there is no rent paid for leased in land, Cost A<sub>1</sub> and Cost A<sub>2</sub>, are same which has been estimated at Rs14863.60. CostB<sub>1</sub>, Cost B<sub>2</sub>, CostC<sub>1</sub>, CostC<sub>2</sub> and Cost C<sub>3</sub> have been estimated at Rs.15767.09, Rs.21198.37, Rs.18777.37, Rs.24208.65 and Rs.26629.52 respectively per hectare.

The contents of the Table 2 reveal that rapeseed and mustard growing farms were noted to earn a gross income of about Rs.42868.25 per hectare. The average yield per hectare was found to be 857 kg. The average cost per kg is about Rs.50. The net income earned of about Rs.18659.60. Family labour income was noted to be Rs. 21669.88. The farm business income was worked out to be Rs.28004.65. The farm investment income was noted to be Rs. 24994.37. The net return over variable cost and returns to management were calculated as Rs.28004.65 and Rs.40447.39 respectively. The Table 2 also presents the returns per rupee of rapeseed and mustard per hectare. The returns per rupee are the important measures of efficiency and found to be 1.77 i.e. the on an average Rs.1 investment brings Rs. 1.77 returns in rapeseed and mustard.

## CONCLUSION

From the study, it may be concluded that cultivation of rapeseed and mustard under zero tillage is profitable. The results of costs and returns of rapeseed-mustard production indicated that the seed, fertilizer, human labour and rental value of owned land were important contributors to the total cost. In order to improve the cultivation of rapeseed and mustard, if inputs and production technology are made available to farmers in time, yield and production may be increased which can help the farmers to increase the income and improve their livelihood conditions. Arranging training programme to upgrade the knowledge on recommended package of practices on cultivation of rapeseed and mustard under zero tillage ; educating the people to develop social consciousness by strengthening local security service through private and public initiatives. The government needs to take responsibilities of developing HYV seeds of rapeseed and mustard to ensure quality of seeds and availability of inputs at reasonable prices at proper time.

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