



ECONOMIC ANALYSIS OF MUSTARD AND SESAME CULTIVATION IN SOME SELECTED AREAS OF SIRAJGANJ DISTRICT

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ABSTRACT

The study was conducted in four upazilas, namely Ullapara, Shahzadpur, Tarash and Belkuchi of Sirajganj district to analyze the cost and return of mustard and sesame cultivation. Thirty mustard and thirty sesame producing farmers were purposively selected from each upazila and thus sample size was 240 for the study. Primary data were collected from the respondents through well-organized structural questionnaire. Data were sorted, scrutinized and analyzed to evaluate economic performance of mustard and sesame cultivation. Cost of cultivation was calculated based on variable and fixed cost basis. Return was measured in form of gross return, gross margin, net return and benefit cost ratio (BCR). Results of the study revealed that cultivation cost of mustard was higher (Tk. 53932 ha⁻¹) than sesame (Tk. 39993 ha⁻¹). Gross return, gross margin, and net return from mustard cultivation were estimated as Tk. 60120, Tk. 15827 and Tk. 6188 ha⁻¹ respectively. While, those were Tk. 70400, Tk. 42046 and Tk. 30407 ha⁻¹, respectively for sesame cultivation. The estimated BCR was 1.11 for cultivation of mustard and 1.76 for cultivation of sesame, which indicated that sesame cultivation is more profitable compared to mustard in the study area.

Keywords: Oilseed crops, cost, gross margin, net return, benefit cost ratio

Introduction

Acute shortage of edible oil has been prevailing in Bangladesh since last several decades. Edible oils have crucial roles in human nourishment by providing calories and aiding in absorption of several fat soluble vitamins viz. vitamin A, D, E and K. Minimum 15% of the total calories must come from oils or fats for maintaining good health. Some oilseeds are also a source of good quality protein, vitamins, and fuel. Oilcake is also an important manure for crop production and livestock feed (Miah and Mondal 2017). Bangladesh is suitable for production of oilseed crops round the year. However, there is continuous decline in both acreage and production except some exceptional years (Rahman and Chowdhury 2010). The area under oilseed cultivation in Bangladesh was 420030 hectare and the production was 901477 tons (BBS 2016). The requirement of edible oil is 1.4 million tons and a maximum 0.55 million tons of its requirement is being fulfilled from domestic production (Salam *et al.* 2012). The shortage amount of edible oil is met through importing from foreign countries. Therefore, it is needed to pay more

attention on how to achieve the required oilseed production in the country through low cost technology. Nevertheless, oilseed crops have caught an attention as considerable subsector of the Department of Agricultural Extension (DAE) under the Ministry of Agriculture and planned a project as Pulse and Oil Crops Research and Development, Vision: 2030 (Rahman and Chowdhury 2010).

The agriculture sector and its development depend on plan, technological support, communication and market price of the crops. In char land, farmers usually carry out production planning and management considering their capability and relative requirements. They absolutely can exploit their income by adopting cost-effective enterprises which handle the resource for maximizing the profits and minimizing expenses, ultimately improve household income. It is a major issue for all the institutions which are the stakeholder motivating agricultural livelihood.

The cost of production is a cumulative result of fixed and variable costs obtained in crop production. Information on cost of production and benefit cost ratio are helpful to policy makers, agricultural scientist, researchers and as

well as farmer's communities. Therefore, present study was undertaken to compare the cost and benefit of two oilseed crops using benefit cost ratio technique.

Materials and Methods

Study area and sampling technique: Two major oilseed crops mustard and sesame were taken into consideration in this study. A three stage sampling procedure was followed to select sample farmers. In the first stage of sampling, study area Sirajganj district was selected purposively based on the area coverage of the aforesaid oilseed crops. In the second stage, four suitable Upazilas (Ullapara, Shahjadpur, Tarash and Belkuchi) of the district were selected for each crop considering data availability, ease of data collection, accessibility and logistic supports. Finally, a total of 120 households for each crop were selected for interview to collect necessary primary data. Thus, a total of 240 mustard and sesame cultivating farmers were interviewed for the study.

Method of data collection: Data were collected personally from the respondents through well-developed pre-tested structured questionnaire for the study. The period of the study was considered from October to January 2018.

Analytical techniques: Collected data were edited, summarized, tabulated and analyzed as per requirement of the study. Descriptive statistics using different statistical tools like averages, percentages and ratios were used in presenting the results for discussion. The following techniques were applied for analyzing the data.

Cost and return analysis: An attempt was made to estimate detailed cost and return, relative profitability of cultivating mustard and sesame in Sirajganj district. The cost and return of oilseeds production was calculated using simple accounting procedures. It was examined on the basis of gross return, gross margin, net return and benefit-cost ratio analysis. Besides, the opportunity cost of family labour and cultivated land were taken into consideration in estimating total cost. Land use cost was calculated on the basis of per year lease value of land. Besides, data on outputs and their prices were also gathered for the study. Interest on operating capital was computed by taking all variable expenses incurred for various operations throughout the four months in mustard and sesame cultivation. Interest rate was assumed to be 9% per annum as if the farmer received loan from bank, he would have to pay interest at the above rate. Since mustard

and sesame producers usually incur costs for different inputs throughout four months for cultivating mustard and sesame, to get an average figure of cost associated with invest, the interest rate was divided by 2. The following equations were used for estimating total cost, gross return, gross margin, net return and benefit-cost ratio.

Total cost: Total cost was calculated all the cost incurred with the production of mustard and sesame. Total production cost was estimated as:

Total cost = Total fixed cost + Total variable cost

Gross return: Gross return was calculated by multiplying the total volume of output of an enterprise by the average price in the harvesting period (Dillion and Hardaker, 1993).

Gross margin: Gross margin is the difference between gross return and total variable costs. Thus gross margin was calculated through the following equation:

$GM = GR - TVC$

Where, GM = Gross margin;

GR = Gross return; and

TVC = Total variable cost

Net return: Net return was calculated by deducting total costs (variable and fixed) from gross return. Thus the formula for net return:

$NR = GR - TC \text{ (TVC + TFC)}$

Where,

NR = Net return

GR = Gross return

TVC = Total variable cost

TFC = Total fixed cost

Benefit cost ratio: The undiscounted benefit cost ratio is a relative measure which was used to compare benefit per unit of cost. Benefit cost ratio (BCR) was estimated as a ratio of gross returns and gross costs. The formula for calculating BCR was used:

$BCR = GR / TC$

Where,

GR = Gross return

TC = Total cost

Results and Discussion

Socio economic profile of the oil seed producing farmers are depicted in the Table 1. The highest portion of the mustard producing farmers was in the age group of 30-45 years (54%) where the highest age group of sesame producing farmers was above 45 years (51%). Agriculture is the major occupation of both mustard and sesame cultivating farmers as 100% for mustard cultivating farmers and 85% of sesame producing farmers are engaged in agriculture. Education level of maximum mustard and sesame producing farmers were found between class 8 to secondary school levels. Family members more than six were found among the mustard growing farmers (46%). While in sesame producing farmers, major family size was 4 to 6 persons that were 44% of this category. The maximum land holding size was 2-4 bigha (1 bigha = 0.33 Acre) per household in both mustard and sesame producing farmers that cover 50% for mustard producer and 54% for sesame producing farmers. Farmers experience on mustard and sesame production was 5 to 10 years that was 74% of mustard producing farmers and 73% of sesame producing farmer.

Oilseed production requires different inputs, such as human labor, seed, fertilizers, pesticides, land preparation and others. The estimated total variable costs per hectare were Tk. 44293/ for mustard and Tk. 28354/ for sesame cultivation that were 82.13% and 70.90% of total of

production cost respectively (Table 2). Among the cost items, hired human labor cost was the highest in both mustard and sesame cultivation which shared 49.48% and 50.61% of the total cost, respectively. Plowing cost was accounted 13.75% of total cost for mustard cultivation and 9.27% for sesame cultivation. Fertilizer cost for mustard was estimated 14.48% of total cost and for sesame it was estimated 6.70% of total cost. The findings of the study indicated that the farmers of the study area used less amount of fertilizer in sesame production compared to mustard. Family labour costs were 4.12% of total cost for mustard and 10.56% for sesame production. Rental value of land costs were estimated 13.75% of total cost for mustard and 18.54% for sesame cultivation. Total cost of production included variable costs (summation of all cash and non-cash expenses) and fixed costs incurred for mustard and sesame production. On an average, per hectare cost of production was Tk. 53932/ ha⁻¹ for mustard and Tk. 39993/ ha⁻¹ for sesame. It was observed that per hectare total production cost of mustard was higher compared to sesame due to use of high amount of inputs, especially human labour and fertilizers.

The average yields of main product mustard and sesame were 927 kg and 1000 kg ha⁻¹ respectively in the study areas (Table 3). By-product was produced from mustard as 1500 kg and from sesame cultivation it was 1800 kg ha⁻¹. The byproduct of the oil seed was used mainly as fuel and organic matter in the Sirajganj area.

Table 1. Socio economic profile of mustard and sesame farmers in Sirajgonj district of Bangladesh

Profile of people	People involved in cultivation of	
	Mustard	Sesame
Age <30 years	-	10%
Age 30-45 years	54%	49%
Age >45 years	46%	51%
Family member < 4	30%	25%
Family member 4-6	24%	44%
Family member > 6	46%	31%
Occupation of agriculture	100%	85%
Occupation of business	-	9%
Other occupation	-	6%
Land size < 2 bigha	24%	45%
Land size 2-4 bigha	50%	54%
Land size >4 bigha	26%	11%
Education < 8 class	-	5%
Education 8 class to Secondary School Certificate	92%	80%
Education > Secondary School Certificate	8%	15%
Experience < 5 years	26%	18%
Experience 5-10 years	74%	73%
Experience > 10 years	-	9%

Table 2. Cost estimation (Tk. ha⁻¹) of mustard and sesame production

Cost Item	Mustard		Sesame	
	Cost (Tk.)	% total cost	Cost (Tk.)	% total cost
Seed	988	1.83	567	1.42
Fertilizer	7809	14.48	2680	6.70
Pesticides	741	1.37	741	1.85
Labor (hire)	26687	49.48	20240	50.61
Plowing	7413	13.75	3707	9.27
Interest on operating capital	655	1.21	419	1.05
Variable cost	44293	82.13	28354	70.9
Labor (family)	2224	4.12	4224	10.56
Land use	7415	13.75	7415	18.54
Fixed cost	9639	17.87	11639	29.10
Total cost (variable cost + fixed cost)	53932	100	39993	100

On an average, gross return was Tk. 60120/ ha⁻¹ for mustard and Tk. 70400/ ha⁻¹ for sesame cultivation (Table 3). This indicated that higher gross return was obtained from sesame cultivation compared to mustard cultivation. Gross margin was obtained by deducting total variable cost from gross return. Gross margin was estimated Tk. 15827 ha⁻¹ for mustard cultivation and Tk. 42046/ ha⁻¹ for sesame cultivation. Net return was found Tk. 6188/ ha⁻¹ for mustard production and it was Tk. 30407/ ha⁻¹ for sesame cultivation. The results of the present study however differ with Salam *et al.* (2012) and Miah and Mondal (2017). Like gross margin and net return, benefit cost ratio was also higher in sesame (1.76) compared to mustard cultivation in the study area.

Table 3. Yield and economic return of mustard and sesame cultivation in Sirajganj district in Bangladesh in the year 2018

Item	Mustard	Sesame
Production of main product (Kg. ha ⁻¹)	927	1000
Production of bi product (Kg. ha ⁻¹)	1500	1800
Total (Kg. ha ⁻¹)	2427	2800
Value of main product (Tk. ha ⁻¹)	55620	65000
Value of bi product (Tk. ha ⁻¹)	4500	5400
Total	60120	70400
Gross margin (Tk. ha ⁻¹ C)	15827	42046
Net return (Tk. ha ⁻¹)	6188	30407
Benefit cost ratio	1.11	1.76

Oil seed crops occupied a vast area in Sirajganj district. Among the oil seed crops mustard and sesame is major in the study area. Cost and return were examined for cultivation of mustard and sesame on the basis of variable cost, fixed cost, gross return, gross margin, net return and benefit-cost ratio. On an average, per hectare cost was found Tk. 53932/ ha⁻¹ for mustard and Tk. 39993/ ha⁻¹ for sesame production. On an average, gross return was Tk. 60120/ ha⁻¹ for mustard and Tk. 70400/ ha⁻¹ for sesame

cultivation. Net return was found Tk. 6188/ ha⁻¹ for mustard production and it was Tk. 30407/ ha⁻¹ for sesame cultivation. The BCR was higher (1.76) for sesame cultivation compared to mustard cultivation (1.11).

The study clearly indicated that both mustard and sesame cultivation in the study area was profitable. But sesame cultivation was more profitable compared to mustard cultivation.

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