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Economics of Production and Marketing of Field Pea in District Jalaun of Uttar Pradesh

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A B S T R A C T

The present study is undertaken to examine the costs and return in production of field pea and their marketing. A two-stage random sampling technique were adopted for selection of village, farmers and the market functionaries for the investigation. Block "Dakore" was selected purposively on the basis of highest area under Pea crop in the district Jalaun. The study reveals that the highest average yield 30.25 qt/ha was obtained through large farms size group followed was 27.50 qt/ha on small size group of farms and 25 qt/ha on marginal size group of farms. Maximum net return of Rs. 41544 per hectare was obtained through large farms followed by Rs. 36402 on small farms and Rs. 31305 on marginal farms. The average cost of production was calculated to Rs. 1310, it was lowest (Rs. 1253/qt) on large farms and higher on (Rs.1374/qt) on marginal farms. In channel I of marketing of field pea, producer's share observed 85.80 percent and, in the channel II, total producer's share found 81.94 percent. It was lower in comparison to channel because of existence of one more middleman. The marketing charges paid by whole seller and retailers came to Rs. 43 and Rs. 35 per quintal, respectively. Price spread in channel I is 14.21 and in channel II is 18.06. From the above findings, it may be concluded that farmers get a little more share in the price paid by the consumer under regulated marketing system in comparison to unregulated marketing.

***Key words*:** Field pea, Cost, Return, Price spread, Marketing margin

Field pea (*Pisum sativum* var. arvense.) belongs to the family Leguminosae which is comprised of three subfamilies and approximately 15,000 species that exhibit diverse morphology, habitat and ecology. Pea is an important Rabi pulse crop of India. Pea was among the first crop cultivated by man which is highly productive, grown for food, forage and vegetable. There are two types grown pea in India, the table pea (*Pisum sativum* var. hortense) is a green coloured, wrinkled seeded sweet in taste, harvested in an immature condition as cash crop, used for table and canning purposes and young green pods are plucked. Another type of pea is grain type used for pulse and popularly known as field pea (*Pisum sativum* var. arvense). The seeds are round or little angular, hard and whitish in colour. The plants are very hardy and tolerance to drought and frost. The sweet pea is another type of pea which has ornamental properties. The plants are tall, twining and bear very fragrant flowers. This type has little or no economic value. In India field pea is grown over an area of 313.50 thousand hectare with a production of about 2560.00 thousand mt with a productivity of 8.2 quintal per hectare. Uttar Pradesh is the major field pea growing state. Uttar Pradesh alone produce about 60 per cent of total pea production in India [1]. Besides, Uttar Pradesh, Madhya Pradesh and Bihar are the major field pea producing states. In Uttar Pradesh Pea is grown all over an area of 53.85 thousand hectare with production of about 534.06 thousand metric tonnes. and productivity 9.91 quintal per hectare (Ministry of Agriculture, Government of India 2016-17).

Pea occupy a position of considerable value because of its importance in the agricultural economy of the state like Uttar Pradesh. The importance of Peas as pulse and as a vegetable crop in human diet. It is a major pulse crop of Jalaun district and Dakor block in particular where it is grown for both vegetable and pulse purpose and is highly remunerative [2]. Pea can be about 20-25 quintal grain from per hectare of land. The popularity of Field pea in study area is also due to its high demand in the market, suitability in existing cropping pattern and also limitation of irrigation. Pulses are subjected to vagaries of monsoon resulting in lower yield compared to irrigated crops like wheat in Rabi season. Among the pulse crops "Table pea" found to more suitable in above condition of farming. The economic importance of the "Table pea" and "Field pea" can be measured by its value of product and the cost incurred in their production. But in case of "Table pea" a disadvantage of the fresh crop is the operation of hand picking and selling it involve more cost [3]. Green pea occupies an important

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place in the economic development of farmers. The problem of production and efficient marketing of farm products has received considerable attention of many researchers and extension workers in the recent years. Their importance has greatly increased owing to the recent changes in agricultural technology as well as the social patterns. As a level for promoting industrialization in predominantly agrarian economics like [4]. Thus, the rate at which agricultural production expands affording on increasing supply of food and raw materials largely determines the pace of economic development, proper planning for procurement and distribution of green pea. In view of high rate of population growth and high marginal propensity to consume, the producers themselves consume most of the increase in agricultural production. Thus, the study of cost, return, marketing cost, margin and price spread, in the economic system is more important than the study of increase in agricultural production. Hence, the present study on all these aspects and the factors that govern the flow of green pea production and marketing was considered in order to identify the weakness of the present production and marketing systems and to provide empirical evidence on its structural components.

MATERIALS AND METHODS

A two-stage random sampling technique were adopted for selection of village, farmers and the market functionaries for the investigation. A list of all field pea growing blocks of the district Jalaun were prepared and out of this one block "Dakore" was selected purposively on the basis of highest area under pea crop. A complete list of all the villages cultivating the field pea of the selected block was prepared with the help of block office records then were arranged in alphabetical order. Out of all farm villages namely Bajeeda, Bohdpura, Kukargaon, Magrai, Piya Niranjanpur were selected at random process for the study purpose.

A list of all those farmers who were having at least 50 per cent area under pea of the selected village was prepared. The farmers were further sub grouped in according to land holding ie-0-1, 1-2 and 2 hectare and above categories and from each category farmers were selected with equal proportion on the basis of the farmers falling under each village and size groups. Thus, A total of 50 farmers (25 from 0 to 1 ha group, 17 from 1 to 2 ha group and 8 from 2 ha and above land holding) were selected randomly from selected villages of the Block Dakore for the present study. The data pertained to the agricultural year 2017-18.

Analytical method

Cost of cultivation: Fixed cost and variable cost incurred on rising the cost of field pea crop constituted total cost of cultivation.

Fixed cost: Fixed cost included on rental value of land. Land revenue and interest and overhead charges including interest on fixed capital, depreciation and repairs.

Variable cost: Variable cost included human labour, bullock labour, machinery powers, cost of seed, irrigation charges, plant protection measure interest on current investment etc.

Total cost = Fixed cost + Variable cost

Costs concept under CACP

Cost A = All variable cost + interest on working capital + depreciation on fixed capital/Rent on land

Cost B = Cost A + rental value on owned land + interest on owned fixed capital

Cost C = Cost B + imputed value of family labour

Income measures

1. *Net income*: It is computed by deducting total cost from gross income

It is equal to gross income - Cost C

2. Family labour income = Net income + imputed value of family labour

It is equal to gross income - Cost B

3. Farm business income = Family labour income + investment on capital.

It is equal to gross income - Cost A (in case of leased in land)

Averages: The following average were used for the study.

$$\text{Arithmetic mean} = \frac{\Sigma X}{N}$$

$$\text{Weightage mean} = \frac{\Sigma WiX}{\Sigma Wi}$$

Where;

X = Value of an item

Wi = Weight of the item

N = Number of item

Producer's share in consumer's price

The producer's share in the consumer's price has been calculated by using formula:

$$P = \frac{C - M}{C} \times 100$$

$$P = \frac{\textit{Net price received by producer}}{\textit{Price paid by consumer}} \times 100$$

Where;

P= Producer's share in the consumer's price

C= Consumer's price

M= Marketing cost (total margin + marketing charges)

RESULTS AND DISCUSSION

Cost of cultivation and income of pea

Total cost incurred on cultivation of field pea and it's break up on different items i.e., human labour, tractor labour, seed, manure and fertilizers, rental value of land, overhead charges on per hectare basis have been worked out in (Table 1). Table reveals that the average cost of cultivation on field pea came to Rs. 39875 per hectare. It was the highest being Rs. 41731 per hectare on big farms of 2 hectare above and the lower being Rs.38195 per hectare on the marginal farms of below 1hectare size group. The highest cost of cultivation on big farms was due to more use of manures and fertilizers, human labour and improved seeds as compared to marginal farms. As regard cost on input items, on different size group of farms, an increasing trend in use of human labour, irrigation was absorbed manure and fertilizer and plant protection with the increase in farm size [5]. The higher use of these inputs on big farms was due to their better's economic condition in cultivation of field pea crop.

Results depicted in (Table 2) revealed that on an average cost A, B and C were worked out to Rs.22291, Rs.34791, Rs.39874 per hectare, respectively. These costs show an increasing trend with the increase in size of farms. It was due to higher investment capacity of the big farmers [6-7]. Results in (Table 3) show that field pea gave an average production about 27 quintals per hectare. The yield came higher on large farms because of more use of input and better management as compared to marginal and small farms. Average value of output came to 68958 per hectare which was higher on large sized farms due to higher yields. As regard the average cost of production per quintal it was worked out at Rs. 2500.

Table 1 Coast of cultivation of field pea under different size group (Rs./ha)

Particular	Size group			
	Marginal	Small	Large	Average
Human labour	8500	9050	9750	9110
a. Family labour	6250	5500	3500	5083
b. Hired labour	2250	3550	6250	4016
Machine power cost (Rs.)	3500	3750	3850	3700
Seed (Rs.)	3200	3350	3575	3375
Manures and Fertilizers (Rs.)	3550	3870	4500	3973
Irrigation	4250	4300	4525	4358
Plant protection	625	750	825	733
Interest on working capital (4%)	945	1003	1081	1010
Rental value of land	12500	12500	12500	12500
Interest on fixed capital (9%) repair and depreciation	1125	1125	1125	1125
Total input cost	38195	39698	41731	39875

Table 2 Cost of cultivation on cost concept (Rs./ha)

Cost	Size group			
	Marginal	Small	Large	Average
Cost A	19445	21698	25731	22291
Cost B	31945	34198	38230	34791
Cost C	38195	39698	41730	39874

Table 3 Yield quintal per hectare and cost of production (Rs./ha)

Particular	Size group			
	Marginal	Small	Large	Average
	Yield of Pea in quintal / hectare			
Main product	25	27.50	30.25	27
By product	35	36.75	38.25	37
	Rate / quintal (in Rs.)			
Main product	2500	2500	2500	2500
By product	200	200	200	200
Main product income	62500	68750	75625	68958
By product income	7000	7350	7650	7333
Gross income	69500	76100	83275	76292
Total input cost	38195	39698	41731	39875
	Cost of production per (in Rs./quintal)			
Total production cost per quintal	1374	1304	1253	1310

Table 4 Cost and return of field pea production (Rs./ha)

Particulars	Size groups			
	Marginal	Small	Large	Average
Input cost	38195	396987	41731	39875
Gross income	69500	76100	83275	76292
Net income	31305	36402	41544	36417
Family labour income	37555	41902	45044	41500
Farm business income	43805	48902	54044	48917
Input output ratio	1:1.63	1:1.91	1:1.99	1:1.84

The average value of gross income, net income, family labour income and farms business income on per hectare basis and input output ratio for pea crop under different size group of farms, have been given in this (Table 4). On an average gave a net income Rs. 36417 ha^{-1} which was comparatively higher on large farms due to higher yields [8]. The average of family labour income and farms business income came to Rs. 41500 and Rs. 48917 ha^{-1}, respectively. The average input output ratio came to 1:1.84. it was slightly higher on large sized farms.

Marketing of pea

The following main marketing channels were identity for marketing of field pea in the study area.

Channel -I

Producer – whole seller – retailer – consumer (regulated market)

This channel was found common with the farmers who sold their products through regulated marketing system. Only big farmers and few small farmers were found to sell their produce through this channel. It may be due to having more marketable surplus and transport facilities available with them.

Channel -II

Producer – village trader – whole seller – retailer – consumer (unregulated market)

This channel was found to be more common with the small and marginal farmer in the marketing of field pea in the study area. percent of the marketable surplus was sold through this channel. In the channel produce was sold to the whole seller I through village trader. Then it passed to the miller whole seller II and retailer.

Price spread

The price spread refers to the difference between the price paid by the consumer and the price received by the producer for equivalent quantity of farm product. This spread consists of marketing cost and margins of intermediaries, which ultimately determined the overall effectiveness of marketing system. The price spread studies are helpful in study the efficiency of marketing system. If goods could be moved from the producers to the ultimate consumers at the minimum cost consistence with the provision of services and consumer desire, the marketing system is said to be efficient.

The prices spread in the marketing of field pea in both channels under study have been worked out in (Table 5). An examination of the marketing charges paid by producer, Wholesaler, Retailer in the two type of markets show that producer have to pay more charges under regulated market system because of higher transportation due to situation of market at a large distance. In case of wholesaler the marketing charges paid by him were higher because of Mandi fees in regulated market [9].

Table 5 Details of marketing charges

Particulars	Regulated Markets (Rs. per quintal)	Unregulated Markets (Rs. per quintal)
Charges paid by producer		
Transportation	15	-
Loading and unloading	5	-
Weighing charges	3	-
Others	2	-
Total	25	-
Charges paid by village trader		
Transportation	-	12
Loading and unloading	-	5
Weighing charges	-	3
Vardana	-	20
Others	-	3
Total	-	43
Charges paid by whole seller		
Transportation	12	15
Loading and unloading	5	5
Weighing charges	3	3
Mandi fees (2.5%)	62.5	00
Vardana	15	15
Others	5	5
Total	102.50	43
Charges paid by retailer		
Transportation	12	12
Loading and unloading	5	5
Weighing charges	3	3
Vardana	15	15
Total	35	35

Table 6 Price spread in field pea (in Rs. per quintal basis)

Particulars	Regulated Market		Unregulated Market	
	In Rs.	In %	In Rs.	In %
Producer sale price	3000	-	2500	-
Marketing charges paid by producer	25	0.72	00	-
Net price received by producer	2975	85.80	2500	81.94
Purchase price of village trader	-	-	43	1.40
Margin of village trader	-	-	180	5.89
Sale price of village trader	-	-	2723	89.24
Purchase price of wholesaler	3000	86.53	2723	89.24
Charges paid by wholesaler	102.50	2.95	43	1.40
Margin of wholesaler	150	4.32	90	2.94
Sale price of wholesaler or retailer purchase price	3252.50	93.79	2846	93.28
Charges paid by retailer	35	1.00	35	1.14
Margin of retailer	180	5.19	170	5.57
Sale price of retailer or consumer purchase price	3467.50	-	3051.00	-

Net price spread in field pea in regulated and unregulated marketing system has been worked out in the (Table 6). The data reveals that marketing in channel -I of field pea producer's share in consumer's price 85.80 percent. In the channel -II producer's share in consumer's price 81.94 percent [10]. It was lower in comparison to channel because of existence of one more middleman. In this channel to marketing cost came to Rs. 86.00 per quintal followed by producer Rs. 00.00 per quintal. The marketing charges paid by whole seller and retailers came to Rs. 43 and Rs. 35 per quintal, respectively. Price spread in channel -I is 14.21 and in channel -II is 18.06. Farmers get a little more share in the price paid by the consumer under regulated marketing system in comparison to unregulated marketing [12]. It was mainly due to higher sale price received by the farme1s on one hand and the lower margin

of profits accompanied by slightly lower total marketing charges under regulated marketing system on the other.

Table 7 Percentage distribution of marketing margins in different channels

Particulars	Channel-I		Channel-II	
	In Rs./qntl.	In %	In Rs./qntl.	In %
Village trader margin	-	-	180	34.74
Wholesaler margin	150	30.45	90	17.37
Retailer margin	180	36.54	170	32.81
Marketing charges	162.50	32.99	78	15.05
Total marketing cost	492.50	100	518	100

Marketing cost and marketing margin

The purpose of studying the marketing cost and margin is to known as to which intermediary agencies intervene between the producer and the consumer. The distribution of marketing margins into its component such as whole seller share, retailer share and the cost of marketing in respect of field pea in both channels of distribution have been given in (Table 7). This table reveals that the total margin of profit charge by intermediaries were higher in channel-II (unregulated) in comparison to channel-I (regulated). Because, that the village trader did not market in the channel-I. The total marketing cost was also higher in channel-II in compression to channel-I. In terms of percentage share marketing cost shared for 32.99 and 15.05 in the total marketing margin of channel-I and channel-II, respectively [12-13]. The percentage share of margin was found to be higher in case of followed by retailer, wholesaler and village trader in both the channels.

CONCLUSION

The highest average yield 30.25 qt/ha was obtained through large farms (2 ha and above) size group followed was 27.50 qt/ha on small size group of farms and 25 qt/ha on marginal size group of farms. Maximum net return of Rs. 41544 per hectare was obtained through large farms followed by rupees 36402 on small farms and rupees 31305 on marginal farms. The average family labour income and farm business income was worked out to Rs. 41500 and Rs. 48917 per hectare respectively. The average cost of production per quintal was calculated to Rs. 1310, it was lowest (Rs. 1253/qt) on large farms and higher on (Rs.1374/qt) on marginal farms. The average benefit cost ratio was computed as 1:1.84, it was higher 1:1.99 large farms and lower on 1:1.63 marginal farms in the study area. In channel I of field pea, producer's share was 85.80 percent however, in the channel -II was 81.94 percent. It was lower in comparison to channel because of existence of one more middleman. The marketing charges paid by whole seller and retailers came to Rs. 43 and Rs. 35 per quintal respectively. Price spread in channel -I is 14.21 and in channel -II is 18.06. It concluded that farmers get a little more share in the price paid by the consumer under regulated marketing system in comparison to unregulated marketing. It was mainly due to higher sale price received by the farmers on one hand and the lower margin of profits accompanied by slightly lower total marketing charges under regulated marketing system on the other.

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