



## Comparative Economics of Contract and Non-Contract Farming of Barley in Punjab

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### ABSTRACT

*The present study had been conducted in south-western zone of Punjab to examine the cost and returns in barley cultivation under contract farming and non-contract farming. In order to accomplish the specific objectives, a sample of 120 farmers, consisting of 80 farmers with contract cultivation and 40 farmers with non-contract cultivation of barley had been selected. The contract farmers were further categorized into two categories i.e. general contract farmers and plot contract farmers. The study revealed that average operational area on overall contract farms (10.06 ha) was significantly high as compared to the non-contract farms (7.46 ha). There was no significant difference in cost of cultivation of barley between overall contract farming and non-contract farming. The return over variable cost (ROVC) was found to be 12 per cent more on overall contract farms (Rs. 46543/ha) than non-contract farms (Rs. 41374/ha). Net returns were found to be the highest in case of plot contract farming of barley (Rs. 14553/ha), whereas in case of general contract farming the net returns (Rs. 6542/ha) were only marginally higher as compared to non-contract farming (Rs. 5414/ha). Thus, strengthening of extension efforts leading to enhanced yield and reduction in cost of cultivation as well as provision of remunerative contract price of barley output were necessary to promote the contract farming of this crop in the study area.*

**Key words:** Contract farming, Barley, Cost of cultivation, Returns

**JEL Classification:** Q10, Q12, Q13

### INTRODUCTION

The farm sector in Punjab is plagued with declining farm incomes, over capitalization and paddy-wheat monoculture leading to decline of water table and other ecological degradation problems. Agriculture being the primary engine of economic growth in state, its performance is of utmost importance to

accelerate growth and achieve fiscal sustainability. Diversification within agriculture is one of the measures which intend to stabilize income and employment in state farming sector. The Johl Committee Report on 'Diversification of Punjab agriculture' recommended that one million hectares, each of wheat and paddy, be brought under high value crops (Government of Punjab 2002). Contract farming is being promoted in the state to achieve

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diversification by promoting specific crops/ varieties, lowering costs of production with better extension and raising returns by assured market and higher prices for the produce. Contract farming can be defined as an agreement between farmers and processing/ marketing firms for the production and supply of agricultural products under forward agreement, frequently at predetermined prices and thus serves the interest of both the parties. The basis of such arrangements is a commitment on the part of the farmer to provide a specific commodity in quantities and at quality standards determined by the purchaser and to assure the market as commitment on the part of company (Kumaracharyulu *et al.* 2005). Contract farming can be described as a halfway house between independent farm production and corporate/captive farming (Kiresur *et al.* 2002). FAO (2001) pointed out that well-organized contract farming appears to offer an important way in which smaller producers can farm in a commercial manner.

Barley (*Hordeum vulgare* L.) grain has been traditionally used as animal feed and grain crop for human consumption in India. Through the history of barley cultivation is quite old but in late 1980s Government of India opened its economy and liberalized policies towards issuing of licenses to new breweries. Due to increased demand of barley malt for brewing, distillation, baby foods, cocoa-malt drinks and medicinal syrups in domestic as well as international market it has become a crop of industrial importance from traditional feed and food crop. In Punjab, Barley is grown on soils with inadequate irrigation facilities. Area under

barley in Punjab during 1980-81 was 65 thousand hectare which accounted for about one per cent of the gross cropped area in State. However, with increase in assured irrigation facilities in state and encroachment by wheat crop the area under barley went down significantly overtime. During 2012-13, area under this crop in state was about 13 thousand hectare, production 47 thousand tonnes and average yield 36.43 quintal per hectare (Anonymous 2014). Although barley is the minor crop in state, still during *rabi* season it is one of the most promising crop to meet the diversification targets under state policy. Contract farming on barley in India was initiated for the first time in Punjab by M/s United Breweries Ltd. (UB Ltd.) in association with Punjab Agro-Industries Corporation (PAIC). This market leader company has been undertaking contract farming of barley in the districts of south-west Punjab since 2002-03. During 2013-14, the UB Ltd. group had a contract farm area spread over 7718 acres. Varieties like VJM 315 and DWRUB 52 have been grown and the entire produce was purchased by UB Ltd., Patiala from the contract famers at pre-decided rates. The present study had been taken with aim to evaluate the economics of contract farming of barley vis-a-vis non-contract farming of this crop.

#### METHODOLOGY

The present study was conducted in the south-western zone of Punjab. The region was selected purposively as it accounts for major share of area under contract farming of barley in state. Based on the maximum area under contract farming, two districts viz. Bathinda and Mansa from the south-western



zone were selected. At third stage of sampling, two blocks *i.e.* Talwandi Sabo and Sardulgarh respectively from Bathinda and Mansa districts were selected on the basis of concentration of contract farmers. Further on the basis of concentration of contract farmers, two villages from each sample block were selected. Using the list provided by the contracting agency, 20 contract farmers were randomly selected from each of sample village. In order to compare, 10 farmers of non-contract farming of barley were also selected from same village. Thus, from study area a total sample of 120 farmers, consisting 80 farmers with contract cultivation and 40 farmers with non-contract cultivation of barley were selected. The contract farmers were further categorized into two categories *i.e.* general contract farmers and plot contract farmers on the basis of purpose of use of produce purchased by contracting agency. The produce purchased from the general contract farmers was used for malting purpose by the contract company while produce purchased from plot contract farmers was used for seed purpose during the next year. The information from respondent farmers was collected/recorded pertaining to socio-economic characteristics as well as on farm size, irrigation status, cropping pattern, level of input use, production and returns. To accomplish the objectives of study, simple statistical techniques such as averages and percentages were applied in the analysis of data.

## RESULTS AND DISCUSSION

### Socio-economic Profile of the Sample Farmers

The appraisal of socio-economic

characteristics like age, family size, education, *etc.* of respondents is very important. The data presented in Table 1 revealed that there was no significant difference between the average age of overall contract farmers (42.83 years) and non contract farmers (42.53 years). Among the contract farmers, average age of general contract farmers and plot contract farmers came out to be 41.57 years and 44.21 years, respectively. Average family size was more in case of overall contract farming (6.5) than non-contract farming (5.55). Average family size of general contract farmers and plot contract farmers were 6.12 and 6.78 respectively. It was examined that 21.25 per cent of overall contract farmers were illiterate in comparison to only 10 per cent of non-contract farmers. Only 13.75 per cent of overall contract farmers had secondary education, where as this percentage was 22.5 as far as non-contract farmers. About 19.05 per cent and 23.68 per cent of general contract farmers and plot farmers respectively were illiterate. Proportion of general contract farmers and plot contract farmers with matric level education was 30.95 per cent and 21.05 per cent respectively. Thus, surprisingly, the contract farmers had relatively low level of education as compared to their non-contract counterparts.

### Structure of Land Holdings

The structure of land holdings is one of the important institutional factors contributing towards agricultural development. Size of land holdings as well as its structure determines the scale of investments and access to other required inputs on a farm. The information on land



**TABLE 1: SOCIO-ECONOMIC PROFILE OF THE SAMPLE FARMERS, PUNJAB, 2013-14**

Particulars	Contract farming			Non-contract farming
	General contract Farming	Plot contract Farming	Overall	
<b>Age of household head (Years)</b>				
Up to 30	8 (19.05)	3 (7.89)	11 (13.75)	2 (5.00)
30-40	10 (23.81)	14 (36.84)	24 (30.00)	15 (37.50)
40-50	12 (28.57)	5 (13.16)	17 (21.25)	11 (27.50)
50 and above	12 (28.57)	16 (42.11)	28 (35.00)	12 (30.00)
Average age	41.57	44.21	42.83	42.53
<b>Family size (persons)</b>				
Below 4	2 (4.76)	2 (5.26)	4 (5.00)	5 (12.50)
4 to 6	22 (52.38)	16 (42.11)	38 (47.50)	24 (60.00)
Above 6	18 (42.86)	20 (52.63)	38 (47.50)	11 (27.50)
Average family size	6.12	6.78	6.5	5.55
<b>Education Status of household head</b>				
Illiterate	8 (19.05)	9 (23.68)	17 (21.25)	4 (10.00)
Primary	5 (11.90)	2 (5.26)	7 (8.75)	3 (7.50)
Middle	4 (9.52)	10 (26.32)	14 (17.50)	6 (15.00)
Matric	13 (30.95)	8 (21.05)	21 (26.25)	15 (37.50)
Secondary	6 (14.29)	5 (13.16)	11 (13.75)	9 (22.50)
Above secondary (Graduate/Post graduate)	6 (14.29)	4 (10.52)	10 (12.50)	3 (7.50)
Total	42 (100.00)	38 (100.00)	80 (100.00)	40 (100.00)

Note: Figures in the parentheses indicate percentage to the total.

holding structure of the sample farms is presented in Table 2. As revealed by the results, the average operational area on overall contract farms was significantly high as compared to the non-contract farms.

Operational area on overall contract farms was 10.06 hectare per farm as compared to 7.46 hectare per farm on non-contract farms. Among contract farms, plot contract farms had operational area at 13.24 hectare per



**TABLE 2: LAND HOLDING DETAILS OF THE SAMPLE FARMERS, PUNJAB, 2013-14**  
(Ha/farm)

Operational holding	Contract farming			Non-contract farming
	General contract	Plot contract	Overall contract	
Own land	5.92 (82.45)	10.71 (80.89)	8.2 (81.51)	6.16 (82.57)
Land leased in	1.26 (17.55)	2.12 (16.01)	1.67 (16.60)	1.3 (17.43)
Land leased out	-	0.4 (3.02)	0.19 (1.89)	-
Operational area	7.18 (100.00)	13.24 (100.00)	10.06 (100.00)	7.46 (100.00)

Note: Figures in the parentheses indicate percentage to the total.

farm as compared to 7.18 hectare per farm on general contract farms. Overall contract farms leased in 16.60 per cent of the operational area as compared to 17.43 per cent in case of non-contract farms. Among contract farms the proportion of leased in land in operational area on plot and general contract farms was 16.01 and 17.55 per cent, respectively. Thus, among two categories of contract farms as well as on non-contract farm, the proportions of owned land and leased in land in operational area were almost similar.

### Cropping Pattern and Cropping Intensity

The cropping pattern indicates the extent of area grown of each crop as a percentage to the gross cropped area. The types of crops raised on farms, the proportion of farm area put under different crops, and the number of times a given unit of land is being cultivated during a year are the important dimensions ought to be considered in evaluating land use pattern in contract farming and non-contract farming. The cropping pattern and cropping intensity on

the sample farms is presented in Table 3.

It is evident from Table 3 that on overall contract farms, wheat and cotton crops dominated in *rabi* and *kharif* season and accounted for 26.73 and 27.83 per cent of gross cropped area respectively. Barley was second most important *rabi* crop and accounted for 20.28 per cent of gross cropped area followed by *rabi* fodders (2.25%) and mustard (1.10%). In case of non-contract farming, in *rabi* season wheat crop was primarily dominated with percentage share of 33.57 per cent of gross cropped area, whereas cotton crop was main crop in *kharif* season with percentage share of 26.06 per cent in gross cropped area. Barley was other important crop grown in *rabi* season and its share in cropping pattern was 12.74 per cent.

Among the contract farming categories, on general contract farms, wheat was the main crop in *rabi* season and comprised 34.71 per cent of the gross cropped area. On these farms barley was the second main *rabi* crop which accounted for 12.29 per cent of gross cropped area followed by *rabi* fodders (2.58%) and mustard (0.56%). In *kharif* season, cotton was the most prominent crop accounting for 30.52 per cent of gross cropped area followed by guar (8.87%), paddy (7.54%) and *kharif* fodders (2.58%). On plot contract farms, in *rabi* season barley was most prominent crop with 25.24 per cent share in gross cropped area. On these farms, with 21.30 per cent of gross cropped area wheat was second most important crop in *rabi* season followed by *rabi* fodders (1.99%) and mustard (1.42%). In *kharif* season after cotton, guar was second most important crop on these farms, which was



**TABLE 3: CROPPING PATTERN AND CROPPING INTENSITY ON THE SAMPLE FARMS, PUNJAB, 2013-14**

Particulars (Ha/farm)	Contract farm			Non-contract farms
	General	Plot	Overall	
<b>Rabi</b>				
Wheat	4.97 (34.71)	5.24 (21.30)	5.1 (26.73)	4.69 (33.57)
Barley	1.76 (12.29)	6.21 (25.24)	3.87 (20.28)	1.78 (12.74)
Mustard	0.08 (0.56)	0.35 (1.42)	0.21 (1.10)	0.61 (4.37)
Fodders	0.37 (2.58)	0.49 (1.99)	0.43 (2.25)	0.36 (2.58)
Any other	-	0.02 (0.08)	0.01 (0.05)	-
<b>Kharif</b>				
Paddy	1.08 (7.54)	0.7 (2.85)	0.9 (4.72)	1.46 (10.45)
Cotton	4.37 (30.52)	6.35 (25.81)	5.31 (27.83)	3.64 (26.06)
Guar	1.27 (8.87)	4.51 (18.33)	2.81 (14.73)	1.07 (7.66)
Fodders	0.37 (2.58)	0.49 (1.99)	0.43 (2.25)	0.36 (2.58)
Any other	-	0.2 (0.81)	-	-
Orchard	0.05 (0.35)	0.04 (0.16)	0.01 (0.05)	-
Gross cropped area	14.32 (100.00)	24.6 (100.00)	19.08 (100.00)	13.97 (100.00)
Net sown area	7.18	13.24	10.06	7.46
Cropping intensity (%)	199.44	185.8	189.66	187.27

Note: Figures in parentheses are percentages to gross cropped area.

grown on 18.33 per cent of gross cropped area followed by paddy (2.85%) and fodders (1.99%). The cropping intensity on overall contract farms and non-contract farms was 189.66 per cent and 187.23 per cent respectively. Among categories of contract

farming, cropping intensity was observed to be highest at 199.44 per cent on general contract farms and lowest at 185.80 on plot contract farms.

#### Cost of Cultivation

Estimation of cost of cultivation of any crop is an important aspect for estimation of profit from that crop. The item wise cost of cultivation of barley on the overall contract farms and non-contract farms is presented in Table 4.

The study revealed that on overall contract farms, the total cost of cultivation of barley was ₹53363.67 per hectare. On these farms the variable cost and fixed cost of barley cultivation was observed to be ₹17379.86 per hectare and ₹35965.81 per hectare which accounted for 32.57 per cent and 67.40 per cent of total cost of cultivation respectively. Among the variable cost, cost of machine labour was ₹6359.79 per hectare which accounted for largest share (11.92%) in total cost of cultivation, followed by expenditure on fertilizers (7.30%), human labour (6.24%), seed (3.63%) and irrigation (1.41%). Amongst the fixed cost components of barley cultivation, on overall contract farms the land rent estimated at ₹33915.06 per hectare accounted for 62.50 per cent of the total cost of cultivation followed by the interest on fixed capital at ₹1555.75 per hectare (2.88%). The total cost of cultivation of barley on non-contract farms were ₹54283.69 per hectare. On these farms variable cost and fixed cost was ₹18323.03 and ₹35960.66 per hectare. The respective share of these components in total cost of cultivation was 33.75 and 66.25 per cent. Among variable cost, major share of total cost of barley cultivation was



**TABLE 4: COST OF CULTIVATION OF BARLEY ON OVERALL CONTRACT FARMS AND NON-CONTRACT FARMS, PUNJAB, 2013-14**

Particulars	Contract farming	Non-contract farming	Difference of contract over non-contract farm (₹/ha)
Human labour	3330.07 (6.24)	3297.5 (6.07)	32.57 (0.99)
Machine labour	6359.79 (11.92)	6778.35 (12.49)	(418.56) (-6.17)
Seed	1937.41 (3.63)	2500.21 (4.61)	-562.8 (-22.51)
Fertilizers	3896.32 (7.30)	3986.08 (7.34)	-89.76 (-2.25)
Micro-nutrients	48.04 (0.09)	52.81 (0.10)	-4.77 (-9.03)
Weedicide	140.09 (0.26)	150.38 (0.28)	-10.29 (-6.84)
Insecticide	330.7 (0.62)	321.88 (0.59)	8.82 (2.74)
Irrigation	751.2 (1.41)	616.2 (1.14)	135 (21.91)
Interest on variable cost @ 7%	587.72 (1.10)	619.62 (1.14)	-31.9 (-5.15)
Variable cost	17379.86 (32.57)	18323.03 (33.75)	-943.17 (-5.15)
Interest on fixed capital	1555.75 (2.88)	1563.04 (2.88)	-7.29 (-0.47)
Depreciation of implements and buildings	495 (0.91)	513.29 (0.95)	-18.29 (-3.56)
Land rent	33915.06 (62.80)	33884.33 (62.42)	30.73 (0.09)
Fixed cost	35965.81 (67.40)	35960.66 (66.25)	5.15 (0.01)
Total cost (VC+FC)	53363.67 (100.00)	54283.69 (100.00)	-920.02 (-1.69)

*Note: Figures in parentheses denote the percentage.*

contributed by machine labour (12.49%) followed by fertilizers (7.34%), human labour (6.07%), seed (4.61%) irrigation (1.14%) and interest on variable cost (1.14%). On non-contract farms, land rent was estimated at ₹33884.33 per hectare, which accounted for 62.42 per cent share of total cost of

cultivation. On these farms interest on fixed capital was calculated as ₹1563.04 per hectare which accounted for 2.88 per cent in total cost.

It was noticed that the total cost of cultivation of barley on overall contract farms was 1.69 per cent lower than non-contract

TABLE 5: COST OF CULTIVATION OF BARLEY ON GENERAL AND PLOT CONTRACT FARMS, PUNJAB, 2013-14

Particulars	General contract farming	Plot contract farming	Difference of plot contract farm over general contract farm	(₹/ha)
Human labour	3307.43 (6.24)	3352.7 (6.25)	45.27 (1.35)	
Machinery labour	6236.93 (11.76)	6482.68 (12.08)	245.75 (3.79)	
Seed	1919.23 (3.62)	1955.6 (3.65)	36.37 (1.85)	
Fertilizers	3761.66 (7.09)	4030.98 (7.51)	269.32 (6.68)	
Micro-Nutrients	75.21 (0.14)	20.86 (0.04)	-54.35 (-260.55)	
Weedicide	132.47 (0.25)	144.7 (0.27)	12.23 (8.45)	
Insecticide	397.13 (0.75)	264.27 (0.49)	-132.86 (-50.27)	
Irrigation	937.2 (1.77)	565.2 (1.05)	-372 (-65.82)	
Interest on variable cost @ 7%	586.85 (1.11)	588.59 (1.10)	1.74 (0.30)	
Variable cost	17354.11 (32.72)	17405.58 (32.44)	51.47 (0.30)	
Interest on fixed capital	1327.59 (2.50)	1783.9 (3.33)	456.31 (25.58)	
Depreciation of implements and buildings	441.17 (0.83)	548.83 (1.02)	107.66 (19.62)	
Land rent	33918.16 (63.95)	33911.97 (63.21)	-6.19 (-0.018)	
Fixed cost	35686.92 (67.28)	36244.7 (67.56)	557.78 (1.54)	
Total cost (VC+FC)	53041.03 (100.00)	53650.28 (100.00)	609.25 (1.14)	

Note: Figures in parentheses denote the percentage.

farms. Fixed cost was almost equal on both types of farms, whereas variable cost on overall contract farms was observed to be 5.15 per cent lower than non-contract farms. In case of contract farming, farmers had to spent ₹562.80 (22.51%) less than non-

contract farming for purchase of seed. Cost of machine labour was more on non-contract farms than contract farms by ₹418.56 per hectare. On the other hand, irrigation cost was 21.91 per cent (₹135/ha) more on overall contract farms as compared to non contract



farms.

The analysis was also done for both categories of contract farming *i.e.* general and plot contract farming and the same is presented in Table 5. On general contract farms total cost of barley cultivation was ₹53041.03 per hectare. On these farms variable cost and fixed cost was of ₹17354.11 and ₹35686.92 respectively, which accounted for 32.72 per cent and 67.28 per cent share in total cost of cultivation. Among the different components of variable cost on general contract farms, ₹3307.43, ₹6236.93, ₹1919.23, ₹3761.66 and ₹937.20 per hectare was spent on human labour, machine labour, seed, fertilizers and irrigation respectively. The respective percentage share of these components in total cost was 6.24 per cent, 11.76 per cent, 3.62 per cent, 7.09 per cent and 1.77 per cent. On these farms land rent was found to be ₹35686.92 per hectare accounted for 63.95 per cent of the total cost of cultivation of barley.

In case of plot contract farming, the total cost was found calculated ₹53650.28 per hectare. On plot contract farms variable cost and fixed cost of barley cultivation were observed to be ₹17405.58 and ₹36244.70 per hectare. In total cost, respective share of variable cost and fixed cost was 32.44 and 67.56 per cent. Among the variable costs, machinery labour accounted for highest share in total cost *i.e.* 12.08 per cent followed by fertilizers (7.51%),

human labour (6.25%), seed (3.65%), interest on variable cost (1.10%) and irrigation (1.05%). Amongst the fixed cost, on plot contract farms, land rent was ₹33911.97 per hectare accounted for 63.21 per cent of the

total cost of cultivation. Interest on fixed cost was ₹1783.90 per hectare which accounted for 3.33 per cent in total cost of cultivation on plot contract farms.

It has been revealed from Table 5 that on plot contract farms total cost of cultivation was higher by 1.14 per cent (₹609.25/ha) than general contract farms. Variable cost had been observed almost equal on both general and plot contract farms where as fixed cost was higher on plot contract farms than general contract farm by ₹557.78 per hectare (1.54%). Plot contract farmers incurred relatively higher amount on machinery labour and fertilizers by ₹245.75 and ₹269.32 per hectare respectively than general contract farms. On the other hand, expenses incurred on micro-nutrients, insecticides and irrigation were found to be more on general contract farms by 260.55, 50.27 and 65.82 per cent more when compared to the plot contract farms.

#### **Returns from Contract and Non-Contract Barley Cultivation**

The comparative economic returns obtained from barley crop under different farming situations are presented in Table 6. The results revealed that average yield of barley obtained on non-contract farms and overall contract farms were 48.31 quintal per hectare and 47.98 quintal per hectare respectively. Thus, surprisingly, yield on overall contract farms was marginally lower than non-contract farms. However, on account of 8.74 per cent higher price received by contract farmers at ₹1218.10 per quintal as compared to ₹1120.17 per quintal by non-contract farmers, the contract farming of barley fetched about 7.08 per cent



**TABLE 6: RETURNS FROM CONTRACT AND NON-CONTRACT BARLEY CULTIVATION ON THE SAMPLE FARMS, PUNJAB, 2013-14**

Particulars	Contract farming			Non-contract farming	Difference of plot contract farm over general contract farm	Difference of overall contract farm over non-contract farm
	General contract farming	Plot contract farming	Overall			
Yield (qtls/ha)	48.28	47.68	47.98	48.31	-0.6 (1.24)	-0.33 (-0.68)
Price (Rs/qtls)	1118.95	1317.24	1218.1	1120.17	198.29 (17.72)	97.93 (8.74)
Value of main product	54022.91	62806	58444.44	54115.41	8783.09 (16.26)	4329.03 (8.00)
Value of bi-product	5559.89	5397.3	5478.6	5582.11	-162.59 (-2.92)	-103.51 (-1.85)
Gross return	59582.8	68203.3	63923.04	59697.52	8620.5 (14.47)	4225.52 (7.08)
Return over variable cost	42228.69	50797.72	46543.18	41374.49	8520.73 (20.18)	5168.69 (12.49)
Net return	6541.77	14553.02	10559.37	5413.83	8011.25 (122.46)	5145.54 (95.04)
Benefit to cost ratio	1.12	1.27	1.2	1.1	-	-

Note: Figures in parentheses denote the percentage.

higher gross returns. The gross returns obtained by overall contract farmers and non-contract farmers were ₹63923.04 and ₹59697.02 per hectare respectively. The return over variable cost from barley on overall contract farms estimated at ₹46543.18 per hectare was 12.49 per cent higher (₹5168.69/ha) as compared to ₹41374.44 on the non-contract farms. The net returns from barley cultivation on contract and non-contract farms were ₹10559.37 and ₹5413.83 respectively. Thus, contract farming of barley resulted into 95.04 per cent higher (₹5145.54/ha) net return as compared to the non-contract farming in the study area. It has been revealed from the Table 6 that average yield on plot contract farm at 47.68 quintal per hectare was 1.24 per cent lower than general contract farms (48.28 qtl/ha).

Plot contract farmers received 17.72 per cent higher price (₹1317.24/qtl) than general contract farmers (₹1118.95/qtl) leading to 14.47 per cent more gross returns on plot contract farms as compared to that on general contract farms. The gross returns obtained by plot contract farmers and general contract farmers were ₹68203.30 and ₹59582.80 per hectare respectively. On plot contract farms, returns over variable cost estimated at ₹50797.72 per hectare were found to be 20.18 per cent more (₹8620.5/ha) as compared to ₹42228.69 per hectare on general contract farms. On plot contract farms and general contract farms net return from barley cultivation was ₹14553.02 and ₹6541.77 per hectare respectively. Thus, the plot contract farming resulted into 122.46 per cent more (₹8011.25/ha) net returns as



compared to the general contract farming. Benefit to cost ratio was 1.27, 1.12 and 1.10 on plot contract farms, general contract farms and non-contract farms respectively.

### CONCLUSION

The study revealed that in south-western region of Punjab, the average operational area on overall contract farms was significantly high as compared to the non-contract farms and barley was the second most important *rabi* crop after wheat on both categories of farms. There was no significant difference in the total cost of cultivation of barley on overall contract and non-contract farms and the land rent a component of fixed cost accounted for the highest share in the total cost of cultivation. Among the variable costs, machinery labour accounted for the highest share in total cost of cultivation followed by fertilizers, human labour and seed. On account of better price realization on plot contract farms, the returns over variable cost as well as the net return obtained on contract farms were significantly higher on overall contract farms in comparison to that on the non-contract farms. Further, among categories of contract farming, profitability on plot contract farms was relatively higher as compared to the general contract farms. To promote barley contract cultivation in state, there is a need to make contract cultivation of this crop more profitable

especially under general contract farming scheme. For this, contracting company should provide good quality and high yielding seeds to farmers along with other associated inputs at lower than market rates to decrease the cost of production. Further, contract price of barley output need to be ensured at least equivalent to the MSP of wheat (as per earlier practice), the main competing crop.

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