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COST AND INCOME STRUCTURE OF WHEAT CULTIVATION IN JAMMU DISTRICT OF JAMMU AND KASHMIR STATE

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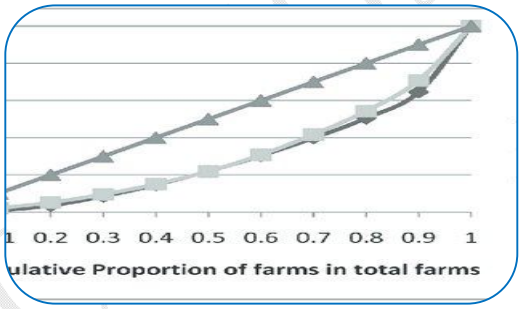
ABSTRACT :

The present study has been made to work out the input use, cost structure and profitability of wheat production in Jammu district. The study is based on primary data collected from 200 sample farmers through interview schedule for the year 2015-16. The results of the study reveal that the average total cost of cultivation of wheat was Rs.44601.28 per hectare. It was highest on small farms (Rs. 45302.08) followed by medium farms (Rs. 43864.62) and large farms (Rs. 43826.38). The variable cost and fixed cost was 50.44 per cent and 49.56 of the cost C2 of wheat cultivation respectively. The cost A1, A2, B1, B2, C1, C2 was Rs. 18789.22, Rs. 18789.22, Rs. 20401.74, Rs.37551.32, Rs. 22064.70, Rs.40546.62 per hectare of Jammu district. The average overall price received by the wheat growers was Rs.1503 per quintal. It varied from Rs.1495 on small farms to Rs.1529 on large farms. The average net income per hectare over Cost-C2 was Rs.20853.90 and it decreased with the increase in size of farms. The overall input-output ratio was 1:1.38 on the basis of total cost of cultivation. It was highest on medium farms (1:1.42) and lowest on small farms (1:1.37). The average cost of cultivation of wheat was about Rs.1009.08 per quintal which was lower than the market price of wheat. The gross income, net income, family labour income, farm business income, farm investment income was Rs.61400.51, Rs.23969.47, Rs.42611.29 and Rs.40948.33 per hectare.



KEYWORDS : *Cost, Gross Income, Family Labour Income, Farm Business Income, Input-Output Ratio, Returns.*

INTRODUCTION:

Wheat is the most important cereal in India in terms of production, consumption and cultivated area. Wheat is an important cereal crop that is consumed by majority of the population in the world. It is the most important staple food of about two billion people. Wheat cultivation in India started 5000 years ago. India is the second largest producer of wheat in the world after china with maximum area under wheat. Wheat is second most important staple food crop after rice in India and generally provides about 50% of the calories and proteins requirement to a vast majority of India's population. From a perpetual food deficit nation until the mid-1960's, India become self-sufficient in wheat production due to the adoption of modern science and technology involving the use of hybrid seeds and modern agronomic practices and the credit for this achievement goes to the much successful strategy of "Green Revolution". India achieved record wheat production of 95.85 million tonnes with area of 30.47 million hectare and productivity of 3146 kg/hectare (Agriculture statistics at a Glance, 2016).

Wheat is grown in all the states of India and J&K is among one of them. During the year 2015-16, the total area under wheat crop in J&K state was 281.87 "000" hectares and production was 5449 "000" Qtls. Although wheat is grown in all the districts of J&K state yet Jammu district is famous from the view point of area and production (Arun Kumar et al., 2003). Area under different food grains in Jammu district is 1,87,942 hectares, out of which 80,204 hectares comes under wheat and rest is shared by other crops. It means wheat is dominant crop in terms of area in Jammu district and is also leading district, compared to other districts, with respect to area under wheat (Digest of Statistics, 2015-16).

In Jammu region, wheat is the main crop followed by maize, paddy, pulses, oilseeds Economy of J&K is still agrarian employing 70% of the population of the state (Economic Survey of J&K, 2017). Even then J&K is a food deficit state which requires more emphasis on raising production and productivity of food grains especially wheat because it is the crop that is mostly grown in all the regions of state especially in Jammu and Ladakh where it is a staple crop. Being a crop that requires less annual rainfall, it can be easily grown in hilly areas and dry land.

OBJECTIVES

- To estimate the cost of cultivation of wheat in Jammu district.
- To estimate the profitability of wheat in Jammu District.

MATERIALS AND METHODS

A multi-stage sampling was adopted for the ultimate selection of major wheat growers. Jammu District has been selected purposively as it has the highest share in terms of area and production of wheat among the other districts of the states. At the second stage of sampling, two blocks namely R.S. Pura and Marh has been selected as it has fertile land with good irrigation facilities. At the third stage of sampling two villages from each of the block thus, selected was chosen through random sampling technique. Thereafter, from each of these 4 villages, 50 sample farmers making a total of 200 samples were chosen randomly. The data collection was done by personal interview method with pre-tested structured schedule prepared for the purpose. The data collection was done during the month of May and June 2016. The farmers were further categorized into (1) Small (0-2 ha), (2) Medium (2.01-5 ha) and (4) Large (Above 5 ha) based on their holding size.

DATA ANALYSIS

A. Cost of cultivation

The costs and returns of Wheat cultivation was estimated through standard cost concepts given by the CACP. It is calculated in Rs. /ha.

Cost A1: All actual expenses in cash and kind incurred in production

Cost A1: Consist of following 16 items of cost as under.

1. Value of hired human labour
2. Value of owned bullock labour
3. Value of hired bullock labour
4. Value of owned machinery
5. Hired machinery charged
6. Value of fertilizers
7. Value of manure (produced on farm and purchased)
8. Value of seed (both farm-produced and purchased)
9. Value of insecticides and fungicides.
10. Irrigation charges (both of the owned & owned and hired tube wells, pumping sets etc.)
11. canal-water charges
12. Land revenue, cesses and other taxes
13. Depreciation on farm implements (both bullock drawn & worked with human labour)

14. Depreciation on farm building, farm machinery.
15. Interest on the working capital.
16. Miscellaneous expenses (wages of artisans, and repairs to small farm implements)

Family labours were charged at the rate of hired labour charges prevailing in the region.

a. Cost A2 = Cost A1+ Rent paid for Leased in land.
b. Cost B1 = Cost A1+ Interest on value of Owned Capital assets (excluding land).
c. Cost B2 = Cost B1+ Rental value of owned land and rent paid for leased-in land.
d. Cost C1 = Cost B1+ Imputed value of Family Labour.
e. Cost C2 = Cost B2+ Imputed value of Family labour.
f. Cost C3 = Cost C2 + 10% of Cost C2 on account of managerial function performed by farmer.

B. Cost of Production:

Cost of production (Rs./Qtl) = (Total Cost - Value of Bye Product)/Yield of Main Product.

C. Income measures: Following income measures were used:

(a) Gross income:

It is the total value of main product as well as of by product: GI = (Qm x Pm) + (Qb x Pb)

Where:

GI = Gross income
Qm = Quantity of main product
Pm = Price of main product
Qb = Quantity of bye product
Pb = Price of bye product

(b) Net income:

Net income = Gross income - Cost C2

(c) Farm business income:

Farm business income = Gross income - Cost A2

(d) Family labour income:

Family labour income = Gross income - Cost B2

(e) Farm investment income

Farm investment income = Farm business income - Imputed value of family labour

(OR)

Net income + imputed rental value of owned land + interest on owned fixed capital invested

(f) Input-output ratio

It can be expressed as the ratio of output to input. The ratio was calculated as

Input-output ratio = O/I

Where,

I = Total input
O = Total output

RESULTS AND DISCUSSION

It is appropriate and necessary to study the cost of cultivation and the returns on wheat so as we can know the income earning capacity of the wheat farmers. Cost of cultivation is an important factor and it is on the basis of which the marketing decisions are made. A farmer whether small or large, prefers to sell his

product in the market only when the market price covers the cost of production so that the farmer ends up with some amount of profit. Profitability is an important component which determines the cultivation of any crop. So, the computation of cost of cultivation is of paramount importance before analysing the marketing behaviour of the farmers. Therefore this study have been undertaken to find out input use, cost structure and profitability of wheat crop.

COST OF CULTIVATION OF WHEAT CROP

The different cost components viz. hired human labour, family labour, machine labour, seed cost, plant protection materials, fertilizer, interest on working capital, land revenue, rental value of owned land, depreciation and interest on fixed capital were taken into consideration for the study. Input wise cost of cultivation of wheat crop is presented in Table-1. It clearly shows that the cost of cultivation in case of small farm was higher (Rs.41183.71 per ha.) as compared to large farm (Rs.39842.16 per ha.) and medium farm (Rs.39876.93 per ha.). On an average, the cost of cultivation per hectare of wheat crop was found to Rs.40546.62 per ha. Out of this Rs.20452.18 (50.44%) was incurred as variable cost and remaining Rs.20094.43 (49.56%) was the expenditure towards fixed cost. It may be noted that 19.18% of the total variable cost was incurred on machine power. It shows that the sampled farmers in the study area make use of machinery at a higher level. The overall rental value of land at Rs.17029.30 per hectare constituted 42% of the total cost of wheat crop cultivation. Table-1 shows that share of machine power (19.18%) was the maximum to the total variable cost for wheat crop followed by manures and fertilizers (11.67%), seed cost (5.06%), hired human labour (4.38%), family human labour (4.10%) and plant protection material (2.84%). Relatively more use of these inputs has increased the total cost on small farms. Similar study has been done by Ahirwar et al. (2015) and Kumar et al. (2003).

Yield, value of output and cost of production per quintal of Wheat Crop

The yield, value of output per hectare and cost of production per quintal of wheat crop have been worked out in Table-2. It indicates that the average yield per hectare of wheat crop was 33.98 quintal. Cost per quintal shows the cost price relationship that generally decides the economic prosperity and degree of commercialization on these farms. Given the price offered by the market mechanism to a unit of output, the farmer's prosperity depend upon his capacity to produce his output at the lesser cost than the market price. The cost of production per quintal of wheat crop on an average was worked out to Rs.995.16. It came to Rs.994.17, Rs.971.43 and Rs.1006.63 for small, medium and large farm size, respectively. The cost of production increased with the increase in the size of farm except medium farm. Therefore it can be concluded that the wheat cultivation was quite remunerative even if the lowest market price is considered.

The average value of production per hectare came to Rs.61698.53. It was Rs.62629.38, Rs.62209.26 and Rs.60455.86 on small, medium and large farms, respectively. The higher value of output on small and medium farms was associated with higher yield of main and bye product. Large farmers make more use of combine harvesters for harvesting the wheat and make use of labour for harvesting only for that quantity of wheat straw which they need for their cattle. Similar study has also been done by Gandhi and Koshy (2006). The higher yield of bye product is that the small farmers make more use of labour during harvesting whereas the medium and large farmers make use of more machinery during harvesting. The average price received by the farmers in the irrigated blocks is Rs.1512 per quintal. The price received by the farmer (Rs.1529 per quintal) was same for both medium and large farmers whereas the price received by the small farmers was Rs.1508 per quintal in the study area. The large and medium farmers fetch higher price than the small farmers due to higher marketable surplus than the small farmers. Similar study has been done by Singh (2013) and Sureshkumar et al. (2014).

Table 1: Input Wise Cost of Cultivation of Wheat (Rs/Ha)

S.No.	Input Cost	Farm Size			
		Small	Medium	Large	Overall
A	**Variable Cost**				
1	Family Human Labour	2562.91	847.52	800.93	1662.96
		(6.22)	(2.13)	(2.01)	(4.10)
2	Hired Human Labour	1698.27	1722.82	2007.48	1775.22
		(4.12)	(4.32)	(5.04)	(4.38)
	Total Human Labour	4261.18	2570.34	2808.41	3438.19
		(10.35)	(6.45)	(7.05)	(8.48)
3	Machine Power	7519.60	8100.07	7906.54	7776.91
		(18.26)	(20.31)	(19.84)	(19.18)
4	Seed Cost	2042.70	2023.04	2100.93	2050.08
		(4.96)	(5.07)	(5.27)	(5.06)
5	Manure & Fertilizers	5171.18	4426.95	4186.02	4730.94
		(12.56)	(11.10)	(10.51)	(11.67)
6	Irrigation/Drainage	98.05	106.12	100.00	100.85
		(0.24)	(0.27)	(0.25)	(0.25)
7	Plant Protection Material	1067.46	1139.48	1349.31	1152.14
		(2.59)	(2.86)	(3.39)	(2.84)
8	Interest on Working Capital	1260.01	1147.88	1153.20	1203.07
		(3.06)	(2.88)	(2.89)	(2.97)
Sub Total		**21420.18**	**19513.88**	**19604.42**	**20452.18**
		(52.01)	**(48.94)**	**(49.21)**	**(50.44)**
B	Fixed Cost				
1	Rental Value of land	17219.64	17270.67	16778.62	17029.30
		(41.81)	(43.31)	(42.11)	(42.00)
2	Depreciation	1089.99	1487.23	1703.48	1452.61
		(2.65)	(3.73)	(4.28)	(3.58)
3	Interest on Fixed Cost	1453.91	1605.15	1755.65	1612.52
		(3.53)	(4.03)	(4.41)	(3.98)
Sub Total		**19763.54**	**20363.05**	**20237.75**	**20094.43**
		(47.99)	**(51.06)**	**(50.79)**	**(49.56)**
C	**Total Cost (A+B)/ Cost C2**	**41183.71**	**39876.93**	**39842.16**	**40546.62**
		(100.00)	**(100.00)**	**(100.00)**	**(100.00)**

Source: Field Survey

Note: Figures in the parenthesis indicate percentage to Cost C2.

Table 2: Per Hectare Yield, Value of Output and Cost of Production per Quintal

S.No.	Particulars	Small	Medium	Large	Overall
1	Input Cost C3	44863.10	43309.12	43268.23	44128.27
2	Yield of main Product (Qtl.)	34.56	33.88	32.93	33.98
3	Value of main Product (Rs./Qtl.)	1508	1529	1529	1512
4	Total Value of main Product (Rs.)	52124.89	51812.20	50335.86	51385.93
5	Yield of bye Product (Qtl.)	21.01	20.79	20.24	20.63
6	Value of bye Product (Rs./Qtl.)	500	500	500	500
7	Total Value of bye Product (Rs.)	10504.49	10397.06	10120.00	10312.60
8	Gross Income (Rs.) (4+7)	62629.38	62209.26	60455.86	61698.53
9	Cost of Production (Rs./Qtl.)	994.17	971.43	1006.63	995.16

Source: Field Survey.

Measures of farm profits of Wheat Crop

The results (Table-3) indicates that on an average the value of net income, average family labour income, farm business income and farm investment income per hectare came to Rs.17570.27, Rs.24697.50, Rs.43438.66 and Rs.41775.70, respectively, on the sample farms.

The input output ratio reflects the criteria for economic viability of the crop based on the returns per rupee invested. Overall, on an average the input-output ratio of wheat crop came to 1:1.40 on the sample farms on the basis of cost C3. It indicates that an investment worth 1 on all inputs used in the cultivation of wheat yielded an output worth 1.40. It was observed to be highest in case of medium farmer 1:1.44 exhibiting increasing trend with farm size except large farms. Similar study has also been done Kumar et al. (2003).

Table 3: Cost and Returns of Wheat

S.No.	Particulars	Small	Medium	Large	Overall
1	Total Cost C3 (Rs./Ha.)	44863.10	43309.12	43268.23	44128.27
2	Gross Income (Rs./Ha.)	62629.38	62209.26	60455.86	61698.53
3	Net income (Rs./Ha.)	17766.28	18900.14	17187.62	17570.27
4	Family labour Income (Rs./Ha.)	25497.64	25172.08	23625.52	24697.50
5	Farm Business Income (Rs./Ha.)	44326.51	44047.96	42159.78	43438.66
6	Farm Investment Income (Rs./Ha.)	41763.60	43200.44	41358.85	41775.70
7	Input- Output Ratio	1:1.40	1:1.44	1:1.40	1:1.40

Source: Field Survey.

Cost and returns of wheat crop

The cost and returns on the basis of cost concept in the production of wheat crop have been presented in Table-4. A perusal of Table-4 shows that the per hectare Cost-A1, Cost-A2, Cost-B1, Cost-B2, Cost-C1, Cost-C2 and Cost-C3 at the overall level were Rs.18259.87, Rs.18259.87, Rs.19872.39, Rs.37001.03, Rs.21535.35, Rs.40116.61 and Rs.44128.27 per hectare, respectively on the sample farms. The average income per hectare over Cost-A1, Cost-B1, Cost-B2, Cost-C1, Cost-C2 and Cost-C3 were worked out to Rs.43438.66, Rs.43438.66, Rs.41826.14, Rs.24697.50, Rs.40163.18, Rs.21581.93 and Rs.17570.27 respectively.

Table 4: Break-Up of Total Cost, Cost Concept wise and Income over different Costs

A) Break Up of Total Cost

S. No.	Particulars	Small	Medium	Large	Overall
1	Cost A1	18302.86	18161.30	18296.07	18259.87
2	Cost A2	18302.86	18161.30	18296.07	18259.87
3	Cost B1	19756.77	19766.45	20051.72	19872.39
4	Cost B2	37131.74	37037.18	36830.34	37001.03
5	Cost C1	22319.68	20613.96	20852.66	21535.35
6	Cost C2	40784.63	39371.93	39334.76	40116.61
7	Cost C3	44863.10	43309.12	43268.23	44128.27

B) Income over Different costs

S. No.	Particulars	Small	Medium	Large	Overall
1	Income over A1	44326.51	44047.96	42159.78	43438.66
2	Income over A2	44326.51	44047.96	42159.78	43438.66
3	Income over B1	42872.60	42442.81	40404.13	41826.14
4	Income over B2	25497.64	25172.08	23625.52	24697.50
5	Income over C1	40309.69	41595.29	39603.20	40163.18
6	Income over C2	21844.74	22837.33	21121.10	21581.93
7	Income over C3	17766.28	18900.14	17187.62	17570.27

Source: Field Survey.

CONCLUSION

The average cost of cultivation (C2) was Rs.40546.62/ha which was highest on small farms (Rs.41183.71/ha) followed by medium (Rs.39876.93/ha) and large farms (Rs.39842.16/ha). Higher cost on small farms was associated with intensive use of family labour, manures and fertilizers, interest on working capital. The overall yield of wheat was 33.98 qtl/ha. It was highest on small farms (34.56 qtl/ha) followed by medium (33.88 qtl/ha)) and large farms (32.93 qtl/ha). Gross income was highest in case of small farms (Rs.62629.38 per ha) followed by medium (Rs.62209.26 per ha) and large farms (Rs.60455.86 per ha). The net income and farm investment income was highest in case of medium farms whereas farm labour income and farm business income was highest in case of small farms. Small farmers used their scare resources optimally as compared to medium and large farms. Input output ratio was found to be highest in case of medium farms (1:1.44) followed by small and large farms (1:1.40) on the basis of cost C3. The average cost of production per quintal of wheat was about Rs. 995.16 which was lower than the market price of wheat. Therefore, it can be concluded that the wheat cultivation was quite remunerative even if the lowest market price is considered. The different cost that is A1, A2, B1, B2, C1, C2 and C3 were Rs.18259.87, Rs.18259.87, Rs.19872.39, Rs.37001.03 Rs.21535.35, Rs.40116.61 and Rs.44128.27. On an average the net return per hectare from wheat on the basis of Cost A1, A2, B1, B2, C1, C2 and C3 were Rs.43438.66, Rs.43438.66, Rs.41826.14, Rs.24697.50, Rs.40163.18, Rs.21581.93 and Rs.17570.27. On the basis of these findings it can be concluded that cultivation of wheat crop is profitable in the study area.

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