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Costs and returns of wheat production of different categories of farmers in Udham Singh Nagar district of Uttarakhand

Dhirendra Kumar, Naresh Kumar and Harshita Bisht

Abstract
The study was conducted in Udham Singh Nagar district of Uttarakhand was based on data collected from 60 farmers (26 marginal & small, 18 medium and 16 large) for the agricultural year 2011-12. The costs and returns of wheat of different category of farms were calculated using CACP concept. Average size of land holding was 2.62 ha. In Rabi season wheat was grown as main crop. The per hectare total cost of production of wheat at aggregate level was Rs. 57392.26. Large farms incurred highest total cost (Rs. 59628.99/ha) and marginal & small the lowest (Rs. 55783.41/ha). The per quintal total cost of production was found highest on large farms (Rs.1330.70) and lowest on medium farms (Rs.1305). At aggregate level it was Rs.1336.57. Net return over cost C_3 was highest on large farms (Rs. 16989.65) and it was lowest on marginal & small farms (Rs. 11205.35). At aggregate level it was Rs. 12754.60.

Keywords: Costs, wheat production, farmers

Introduction

Indian economy is predominantly an agrarian economy. The occupational distribution of working population in our country is highly skewed in favour of agriculture and allied activities with about 58.2 percent of the working population engaged in it (2001 census). However, contribution of agriculture to national GDP has come down substantially from 58 percent in 1950-51 to 14.1 percent in 2011-12 (Economic Survey 2011-12) [7].

In India, majority of the farming community belongs to marginal and small farmers (76.2%) who have only 29 per cent of the total operational holding, while 71 percent of the operated area is owned by medium and large farmers. The food, fodder and fuel production will have to be increased by 60 per cent in the next 25 years to meet the needs of the growing population. It is projected that by 2025 the country's population will be nearly 1.4 billion requiring annually 380 million tonnes of food grain. Inspite of increase in food production, which is primarily in the north-west India, where food production has increased, while it has declined in all other parts of the country. The per capita availability of land has declined to 0.48 hectare. Tanveer Ahmed (2006) [2] found that with the decline in farm size, it would be increasingly difficult to produce enough food for the family. Only 25 to 30 per cent of the modern agricultural technology has reached the farmers. This modern technology however has been restricted to favourable farming situations. Since there is no further scope for horizontal expansion of land for cultivation, the only alternative left is for vertical expansion and that too through diversification of the farming system.

Wheat is the leading food crop in world farming. It is main food crop of temperate zone. It is also extended to warm regions of temperate and sub-tropics to tropical low lands. It is one of the most ancient crops of the world. Its cultivation began in the Neolithic period. Bread wheat is known to have been grown in the Nile valley by 5000 B.C., and its apparently later cultivation in other regions (e.g., the Indus and Euphrates valleys by 4000 B.C., China by 2500 B.C., and England by 2000 B.C.) indicate that it spread from Mediterranean centers of domestication. The civilizations of W Asia and of the European peoples have been largely based on wheat, while rice has been more important in E Asia. Since agriculture began, wheat has been the chief source of bread for Europe and the Middle East. It was introduced into Mexico by the Spaniards* around 1520 and into Virginia by English colonists early in the 17th century.

The total area of wheat in the world is around 220.89 million hectares with a production of 701.39 million tonnes (2010-11). The normal world productivity is 3175 kg/ha. The major wheat producing countries are China, India, Russia, USA, France, Australia, Canada, Pakistan,

Germany, Kazakhstan, Ukraine, Turkey, Argentina and Iran. These countries contribute about 78% of the total world wheat production.

During the last two decades Indian agriculture has been facing major challenges like deceleration in growth rate, inter-sectoral and inter-regional equity, declining input efficiency, degradation of natural resources, etc. with consequent adverse effects on food and nutritional security, food inflation and poverty reduction. The growth in agriculture in the 11th Plan is likely to be around 3.2 percent per year, which is higher than 10th Plan growth rate but lower than the target (4.0%) for 11th Plan. The 12th Plan growth target for agriculture sector has been set at 4 percent with food grains growth at about 2 percent (Vijay Paul Sharma). There has been a decline in overall area under food grains during 2011-12 (4th Advance Estimates) as compared to 2010-11. The area coverage under food grains during 2011-12 stood at 125 million hectares compared to 126.76 million hectares last year (Economic survey of India 2011-12) [7].

Considering the above facts, there is an urgent need to raise the production level of wheat because the population of our country is increased around 181 million in last decade (Census of India 2011). The current production level of the country may not be enough to feed the increasing population in future.

Uttarakhand is one of the wheat producing states in India where wheat accounts 47% of total food grains produced in the state. In Uttarakhand, Udham Singh Nagar district is having highest area under wheat crop i.e., 104.46 thousand hectare. This may be due to higher price of inputs, lack of credit, lack of quality inputs, pest and disease attack and natural calamity etc. Further, as the soils of Udham Singh Nagar are very productive and by using the proper technology we can increase the average productivity of district from 40 to 45 quintal per hectare. As the land frontier has already been exhausted, it is the adoption of modern technology that can take the wheat productivity to the desired level against the backdrop of land and labour which is a future challenge ahead.

Methodology

The present study was conducted in Udham Singh Nagar district of state Uttarakhand. Udham Singh Nagar is surplus district in wheat production and land holding distribution is quite satisfactory. Modern methods of cultivation are practiced to considerable extent in the district.

Sampling Design

Firstly, the list of all blocks of the district was prepared and two blocks, Rudrapur and Gadarpur were selected purposively and in the second Stage of sampling from Rudrapur block one village named Kachi Khamaria and from Gadarpur block one village named Gadarpur were selected purposively due to proximity of the area and convenience in the data collection. Then, a complete list of farmers along with their land holding size of each selected village was prepared with the help of respective village Pradhans and Panchayat members. A total population of 123 wheat growing farmers was obtained. The farmers of selected villages were categorized into marginal & small, medium and large farmers on the basis of their operational land holdings and a sample of 30 farmers were selected randomly by using the method of probability proportion to size from each village with a restriction that from each village, a minimum number of 5 farmers were selected from each size groups and thereby the total sample size of 60 farmers was obtained. The present study was mainly based on primary data. The required primary data were collected from selected farmers of the study area. Most of the required secondary data were obtained through websites. Information was also collected from offices like Vikash Bhawan Rudrapur (District Udham Singh Nagar), Block Development Offices (BDO) etc. Besides some basic information were also collected from different journals and publications.

Estimation of cost and return from wheat production

The cost of wheat production has been worked out on per hectare basis from different categories of farmers.

a. **Cost:** the term cost refers to all the expenses incurred in cash or kind in the process of crop production.

CACP cost concept: Farmers differ with respect to extent of resources owned and their use. Some resources are owned by them while others are purchased or hired in different proportions. Farmers give different weightage to different resources for making production decisions. Some farmers are interested to know the returns over the direct costs involved in crop production while others are interested in considering the indirect costs as well. So, it was considered important to work out the net returns over various costs concepts adopted by the Commission for Agricultural Costs and Prices (CACP). The various cost concepts are summarized as follows:

Cost A_1 = All the variable costs excluding family labour costs and including depreciation.

a. Value of hired human labour (casual labour)
b. Value of hired and owned machine labour
c. Value of manures (owned and purchased)
d. Value of fertilizers
e. Value of seed (farm produce and purchased)
f. Value of plant protection chemicals
g. Irrigation charges
h. Interest on working capital
i. Depreciation on farm implements
j. Land revenue
k. Miscellaneous expenses

Cost A_2 = Cost A^1 + rent paid for leased in land.

Cost B_1 = Cost A^1 + interest on own fixed capital excluding land.

Cost B_2 = Cost B_1 + Imputed rental value of own land (net of land revenue) + Rent paid for leased-in land.

Cost C_1 = Cost B_1 + imputed value of family labour.

Cost C_2 = Cost B_2 + imputed value of family labour.

Cost C_2^* = Cost C_2 will be estimated by taking into account statutory minimum wage rate or actual wage rate, whichever is higher.

Cost C_3 = Cost C_2^*+ 10% of Cost C_2^* on account of managerial function performed by farmers.

Note: If there is no case leased in land then cost A1 will be same as cost A2.

Total cost of production

It includes operational costs, material costs, and other costs in wheat production. In operational cost the cost of hiring human labour, machine power and miscellaneous charges have been estimated at prevailing rates during the particular period of time (2011-12) in the study area. Hired labour charges at actual wages paid in cash and kind payments converted into monetary terms at the prevailing market price were included. Imputed value of family labour was also calculated. Thus total

wage includes both cash and kind. In case of tractor and other machinery the same hiring charges were applied to all those cases who owned assets and who didn't.

In case of materiel cost, cost of seeds, chemicals, fertilizers, manure and irrigation were calculated at the prevailing price at the time of application on per farm and per hectare basis for different categories of farmers. Many farmers used the own produced seeds. Prevailing rate at the time of sowing were used to compute cost of own seeds. The main sources of irrigation in the study area were submersible pumps so per farm and per hectare irrigation charge were calculated accordingly.

Other costs include interest on working capital, interest on fixed assets, rental value of land, land revenue and depreciation. Simple interest was calculated on working capital at the rate of 7% per annum after subsidy was given to farmer. As investment is made partly in different stage of production, the interest was calculated for one cropping season. Rental value of land and land revenue prevailed in the study area during study period has been taken. Depreciation on fixed assets per hectare also has been calculated for one cropping season (Rabi).

Gross and net returns

Gross return includes total value of grain output and total value of by-product of produce. On the other hand net returns were obtained by deducting all the expenses from gross returns.

Result Discussion

Costs and returns of wheat production

The right use of inputs is necessary to maximize the level of output in any production enterprise. A study of the costs of all inputs will help to bring out the extent of benefit derived from the farm returns. The allocation of area under a particular crop by farmers besides other factors depends on the level of profit generated per unit area. Hence, study of costs and returns of wheat crop exercises an important role in determining the relative profitability of wheat crop enterprises. Table 1 reveals that per farm cost and returns and Table 2 reveals that per hectare cost and returns in the wheat production.

Per farm costs and returns from wheat

Table 1 showed that cost A_1 was found to be Rs. 54750.57 per farm at aggregate level. Large farmers have cost A_1 Rs. 108862.72 followed by medium Rs. 57109.92, marginal & small farms Rs. 21825.77. As the land holding size increases, the expenditure on variable cost increases that's why cost A_1 was higher on large farms. In the study area, no case of leased in land has been found in both seasons. In this way cost A_2 was same as cost A_1. In case of cost B_1, it was for large farms Rs. 112732.47 and marginal & small farms Rs. 22524.81. At aggregate level it was Rs. 56680.75. Cost B_2, it was for large farms (Rs. 181552.72) and marginal & small farms (Rs. 36845.89). When we added imputed value of family labour to the cost B_1, we got cost C_1. This cost C_1 was estimated on large farms Rs. 128497.49 and marginal & small farms Rs. 28784.28. As far as the cost C_2 is concerned farmer's expenditure was Rs. 103827.81 at aggregate level and it was on large farms (Rs. 197317.74) and marginal & small farms (Rs. 43105.36). Cost C_3 is the total cost of production. Large farmers were found to spend total cost (Rs. 217049.52) followed by medium farms (Rs. 120477.95), marginal & small farms (Rs. 47415.89). At aggregate level, it was Rs. 114210.59.

The per farm net returns after subtracting total cost (Cost C_3) from gross returns were found to be Rs. 9524.55, Rs. 28906.68, Rs.61842.33 and Rs. 25381.65 on marginal & small, medium, large and overall size of farms respectively. Thus the trend of realizing net returns per farm showed positive relationship between size of farms and net returns per farm.

Table 1: Per farm costs and returns of wheat crop. (Rs.)

Particulars	Marginal & Small	Medium	Large	All farms
Average size of farm (ha)	0.93	2.38	5.64	2.62
Average area under wheat (ha)	0.85	2.16	3.64	1.99
A. Operational Cost				
1..Human labour				
(a)Hired labour	1968.48 (4.15)	10247.49 (8.50)	21601.22 (9.95)	7978.53 (6.98)
(b)Owned labour	6259.47 (13.20)	10276.46 (8.53)	15765.02 (7.26)	11488.93 (10.06)
2.Machine	9874.60 (20.82)	19339.49 (16.05)	33634.26 (15.49)	20266.56 (17.74)
3. Miscellaneous charges	29.09 (0.06)	108.00 (0.09)	186.55 (0.08)	86.57 (0.07)
Sub Total	18132.66 (38.23)	39971.43 (33.18)	71187.04 (32.78)	39820.58 (34.86)
B. Material cost				
1.Seed	2253.66 (4.75)	5923.07 (4.92)	10152.58 (4.68)	5403.55 (4.73)
2,Fertilizers and Manures	5269.89 (11.11)	13734.92 (11.40)	26596.35 (12.25)	13019.95 (11.39)
3.Irrigation Charges	1303.31 (2.75)	3559.36 (2.95)	7575.09 (3.49)	3410.34 (2.99)
4.Plant Protection Chemicals	310.66 (0.65)	1065.05 (0.88)	2035.78 (0.94)	906.33 (0.79)
Sub Total	9137.53 (19.27)	24282.39 (20.17)	46359.80 (21.36)	22740.17 (19.91)
C. Other costs				
1.Interest on Working Capital	317.79 (0.67)	748.38 (0.62)	1369.19 (0.63)	726.41 (0.64)
2.Rental Value of Owned Land	14346.58 (30.26)	40211.59 (33.38)	68929.44 (31.76)	35717.83 (31.27)
3.Land Revenue	25.50 (0.05)	64.80 (0.05)	109.20 (0.05)	59.70 (0.05)
4.Depreciation	472.77 (0.99)	2319.39 (1.92)	5602.51 (2.58)	2892.64 (2.53)
5.Interest on Owned Fixed Assets	699.04 (1.47)	1992.25 (1.65)	3869.76 (1.78)	1930.18 (1.69)
Sub Total	15861.69 (33.45)	45336.41 (37.63)	79880.09 (36.80)	41326.79 (36.18)
Grand Total(A+B+C)	43130.87 (90.96)	109590.24 (90.96)	197427.94 (90.96)	103887.53 (90.96)
Cost A_1	21825.77 (46.03)	57109.92 (47.40)	108862.72 (50.15)	54750.57 (47.94)
Cost A_2	21825.77 (46.03)	57109.92 (47.40)	108862.72 (50.15)	54750.57 (47.94)
Cost B_1	22524.81 (47.50)	59102.18 (49.06)	112732.47 (51.94)	56680.75 (49.63)
Cost B_2	36845.89 (77.70)	99248.98 (82.38)	181552.72 (83.65)	92338.89 (80.85)

Cost C_1	28784.28 (60.70)	69378.62 (57.59)	128497.49 (59.20)	68169.68 (59.69)
Cost C_2	43105.36 (90.91)	109525.41 (90.91)	197317.74 (90.91)	103827.81 (90.91)
Cost C_2*	43105.36 (90.91)	109525.41 (90.91)	197317.74 (90.91)	103827.81 (90.91)
Cost C_3	47415.89 (100)	120477.95 (100)	217049.52 (100)	114210.59 (100)
Yield of main product (qt/farm)	35.64	92.32	163.11	85.45
Yield of by- product (qt/farm)	32.78	87.63	160.23	80.83
Price of main product (Rs./qt)	1038.47	2646.58	4547.71	2448.02
Price of by- product (Rs./qt)	347.35	894.00	1706.25	848.24
Return from main product (Rs.)	43543.06	113114.94	203782.71	105129.91
Return from by- product (Rs.)	13397.39	36269.66	75109.11	34462.32
Gross Return (Rs./farm)	56940.45	149384.63	278891.85	139592.25
Net Return (Rs./farm) over				
Cost A_1	35114.67	92274.70	170029.13	84841.68
Cost A_2	35114.67	92274.70	170029.13	84841.68
Cost B_1	34415.63	90282.45	166159.38	82911.49
Cost B_2	20094.55	50135.65	97339.13	47253.37
Cost C_1	28156.17	80006.01	150394.35	71422.57
Cost C_2	13835.08	39859.21	81574.11	35764.44
Cost C_2*	13835.08	39859.21	81574.11	35764.44
Cost C_3	9524.55	28906.68	61842.33	25381.65
Cost of production (Rs./qt)	1330.39	1305.00	1330.70	1336.57
Net Return (Rs./qt)	267.24	313.11	379.14	297.03
Returns per rupee invested	1.20	1.24	1.28	1.22

Note: Figures in parentheses indicate the percentage of total cost (Cost C_3).

Per hectare costs and returns from wheat

Table 2 showed that cost A_1 was found to be Rs. 27512.85 at aggregate level. Large farmers have highest cost A_1 Rs. 29907.34 followed by medium Rs. 26439.78, marginal & small farms Rs. 25677.38. In case of cost B_1, it was Rs. 28482.79 at aggregate level. As far as the cost C_2 is concerned farmer's expenditure was Rs. 52174.78 at aggregate level and it was highest on large farms (Rs. 54208.17) and lowest on medium farms (Rs. 50706.21). The per hectare total cost according to Cost C_3 was worked out and it was highest on large farms (Rs. 59628.99) followed by marginal & small farms (Rs. 55783.41), medium farms (Rs. 55776.83). At aggregate level, it was Rs. 57392.26.

Table 2: Per hectare costs and returns of wheat crop (Rs.)

Particulars	Marginal & Small	Medium	Large	All farms
Average size of farm (ha)	0.93	2.38	5.64	2.62
Average area under wheat (ha)	0.85	2.16	3.64	1.99
A. Operational Cost				
1..Human labour				
(a)Hired labour	2315.86 (4.15)	4744.21 (8.50)	5934.40 (9.95)	4009.31 (6.98)
(b)Owned labour	7364.08 (13.20)	4757.62 (8.53)	4331.05 (7.26)	5773.33 (10.06)
2.Machine	11617.18 (20.82)	8953.47 (16.05)	9240.18 (15.49)	10184.20 (17.74)
3. Miscellaneous charges	34.23 (0.06)	50 (0.09)	51.25 (0.08)	43.5 (0.07)
Sub Total	21331.36 (38.23)	18505.29 (33.18)	19556.88 (32.78)	20010.34 (34.86)
B. Material cost				
1.Seed	2651.37 (4.75)	2742.16 (4.92)	2789.17 (4.68)	2715.35 (4.73)
2,Fertilizers and Manures	6199.88 (11.11)	6358.76 (11.40)	7306.69 (12.25)	6542.69 (11.39)
3.Irrigation Charges	1533.30 (2.75)	1647.85 (2.95)	2081.07 (3.49)	1713.74 (2.99)
4.Plant Protection Chemicals	365.48 (0.65)	493.08 (0.88)	559.28 (0.94)	455.44 (0.79)
Sub Total	10750.03 (19.27)	11241.85 (20.15)	12736.21 (21.36)	11427.22 (19.91)
C. Other costs				
1.Interest on Working Capital	373.88 (0.67)	346.47 (0.62)	376.15 (0.63)	365.03 (0.64)
2.Rental Value of Owned Land	16878.33 (30.26)	18616.48 (33.38)	18936.66 (31.76)	17948.66 (31.27)
3.Land Revenue	30 (0.05)	30 (0.05)	30 (0.05)	30 (0.05)
4.Depreciation	556.20 (0.99)	1073.79 (1.92)	1539.15 (2.58)	1453.59 (2.53)
5.Interest on Owned Fixed Assets	822.40 (1.47)	922.34 (1.65)	1063.12 (1.78)	969.94 (1.69)
Sub Total	18660.81 (33.45)	20989.08 (37.63)	21945.08 (36.80)	20767.23 (36.18)
Grand Total(A+B+C)	50742.20 (90.96)	50736.22 (90.96)	54238.17 (90.96)	52204.79 (90.96)
Cost A_1	25677.38 (46.03)	26439.78 (47.40)	29907.34 (50.15)	27512.85 (47.94)
Cost A_2	25677.38 (46.03)	26439.78 (47.40)	29907.34 (50.15)	27512.85 (47.94)
Cost B_1	26499.78 (47.50)	27362.12 (49.06)	30970.46 (51.94)	28482.79 (49.63)
Cost B_2	43348.11 (77.70)	45948.6 (82.38)	49877.12 (83.65)	46401.45 (80.85)
Cost C_1	33863.86 (60.70)	32119.73 (57.59)	35301.51 (59.20)	34256.12 (59.69)
Cost C_2	50712.19 (90.91)	50706.21 (90.91)	54208.17 (90.91)	52174.78 (90.91)
Cost C_2*	50712.19 (90.91)	50706.21 (90.91)	54208.17 (90.91)	52174.78 (90.91)
Cost C_3	55783.41 (100)	55776.83 (100)	59628.99 (100)	57392.26 (100)
Yield of main product (qt/ha)	41.93	42.74	44.81	42.94
Yield of by- product (qt/ha)	38.57	40.57	44.02	40.62

Price of main product (Rs./qt)	1221.73	1225.27	1249.37	1230.16
Price of by- product (Rs./qt)	408.65	413.89	468.75	426.25
Return from main product (Rs.)	51227.13	52368.03	55984.26	52829.10
Return from by- product (Rs.)	15761.63	16791.51	20634.37	17317.75
Gross Return (Rs.)	66988.76	69159.55	76618.64	70146.86
Net Return (Rs.) over				
Cost A_1	41311.38	42719.77	46711.30	42634.01
Cost A_2	41311.38	42719.77	46711.30	42634.01
Cost B_1	40488.98	41797.43	45648.18	41664.07
Cost B_2	23640.65	23210.95	26741.52	23745.41
Cost C_1	33124.90	37039.82	41317.13	35890.74
Cost C_2	16276.57	18453.34	22410.47	17972.08
Cost C_2*	16276.57	18453.34	22410.47	17972.08
Cost C_3	11205.35	13382.72	16989.65	12754.60
Cost of production (Rs./qt)	1330.39	1305.00	1330.70	1336.57
Net Return (Rs./qt)	267.24	313.11	379.14	297.03
Returns per rupee invested	1.20	1.24	1.28	1.22

Note: Figures in parentheses indicate the percentage of total cost (Cost C_3).

The per quintal cost of production at Cost C_3 was found to be highest on large farms i.e. Rs. 1330.70. While marginal & small and medium farms have Rs. 1330.39 and Rs.1305 respectively and for all farms, it was Rs. 1336.57.

The yield of main product and by- product of all categories of farmers was estimated 42.94 quintal and 40.62 quintal respectively. It is very interesting to note that average yield of main product is quite higher than district and state average, yet the farmers are not satisfied with the present yield. The yield of large farms was found highest (44.81 quintal). Medium farms harvested a good yield 42.74 quintal. Marginal & small farmers received the lowest yield which was 41.93 quintal. Due to better packages of practices of large farmers, having large land holding, received higher yield compared to those having smaller land holding. The price of main product was found highest in case of large farmers (Rs. 1249.37/qt), it was possible due to their retention capacity and high marketable surplus and it was Rs. 1230.16/qt at aggregate level. Marginal & small farms received lowest price of the produce which was Rs. 1221.73/qt while it was Rs.1225.27/qt on medium farms.

The yield of by product ranged from 38 to 44 quintal. It recorded highest on large farms (44.02 quintal) and lowest on marginal & small farms (38.57 quintal). At aggregate level, farmers sold their by product at the rate of Rs. 426.25/qt and it was highest in case of large farmers (Rs. 468.75/qt) followed by medium (Rs. 413.89/qt), marginal & small farmers (Rs. 408.65/qt). Contribution of main product to gross return was around 75.31%, rest was coming from by product. Highest gross return was earned by large farms (Rs. 76618.64) followed by medium (Rs. 69159.55) and marginal & small farms (Rs. 66988.76). For all farmers, it was Rs. 70146.86 per hectare.

Table 2 revealed that returns over cost A_1 was highest on large farms (Rs. 46711.30) while marginal & small farms were able to earn only Rs. 41311.38. Large farms also earned highest net return over cost B_1 (Rs 45648.18) which was lowest on marginal & small farms (Rs. 40488.98). The return over cost C_2 at aggregate level was Rs. 17972.08. The per hectare returns over Cost C_3 (net return) was estimated Rs. 16989.65 on large farms while medium and marginal & small farms earned net return (net return over Cost C_3) Rs. 13382.72 and Rs. 11205.35 respectively. The per quintal net return over Cost C_3 was found to be highest on large farms Rs. 379.14 followed by medium farms (Rs. 313.11), marginal & small farms (Rs. 267.24). The returns per rupee invested at aggregate level were found 1.22. Large farmers were having better returns per rupee invested (1.28) against the 1.24 and 1.20 for medium, marginal & small farmers, respectively; reflecting better management on large farms.

Conclusion

The average annual income is not same for all categories of farms so financial status is not satisfactory in the study area. The wheat production in U. S. Nagar district of Uttarakhand state yielded an average return of Rs.70146.86 per hectare at aggregate level and large farmers had the highest return of Rs. 76618.64 and followed by medium and marginal & small farmers were having the return of Rs.69159.55 and Rs.66988.76 respectively. Net returns (per hectare) over cost C_3 was found Rs. 11205.35 on marginal & small, Rs. 13382.72 on medium and Rs. 16989.65 on large farms. The returns per rupee invested at aggregate level were found 1.22. Large farmers were having better returns per rupee invested (1.28) against the 1.24 and1.20 for medium and marginal & small farmers, respectively; reflecting better management on large farms. Sufficient institutional credit facilities which may enable to repay the loan are required to increase the retention capacity particularly of marginal & small and medium farmers.

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