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The costs and returns of diversification on marginal and small farms in paddy cultivation of Kanpur District of Uttar Pradesh

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Abstract

The force with in agriculture some of the sub sector like animal husbandry occupy a more significant place compared to crop production of District Kanpur Dehat in Uttar Pradesh is well known for intensive cultivation and agricultural diversification the availability of enough assured irrigation facilities, production input and infrastructure facilities will led to higher intensity of cropping and more diversified agriculture the farms are a very specific as growing of variety of crops like oil seed and vegetable along with cereal.

Keywords: agriculture, diversification, cultivation and cropping etc.

Introduction

The farming system includes the entire gamut of all farm activities and related decisions with regard to development, management and allocation of all the exchange. It can also be designed to help poverty alleviation and a planned diversification increases both individual and social gains. Diversification become necessary since growing of basis stable such as cereals cannot alone supports economic development, not with stand the need to ensure food security to the people in since diversification to commercial crops/commodities become an essential strategy that can increasing income in agriculture, minimize risk due to crop failure and above all earn foreign diversification in agriculture. It has been active in analyzing a number source of data on diversification. Ministry of Agriculture and Cooperation Govt. of India (2011-12).

Diversification in agriculture can broadly be defined as producing increased variety of agricultural impact on rural communities, the rural economy and the environmental and its position within the overall economy is changing. A possible of rational response to these changing economic circumstances farm occupiers to enhance their household income from sources other than conventional farming production through diversifying their business activities. Diversification is widely held to offer considerable scope for improving the economic viability of many farm businesses and in-turn reducing their dependence on the production of primary subsidies in agriculture commodities.

Method and Materials

The present investigation was undertaken to study the diversification of Agriculture in Kanpur dehat and it satiated Geographic features: 26 n to 25 55'n latitude : 79"30'e to 80"e longitude : A total of 200 sample farmers were selected for the study by random method, with allocation proportional to the number of farmers in the different selected villages. The number in each village was further allocated in proportion to the total number of farmers falling in each of the above mentioned two groups. Thus, in all study was confined to a random sample of 200 small and marginal farms selected from 20 villages in 2 blocks in district Kanpur dehat.

Result

Paddy is one of the important kharif crop of the locality. It occupied 16.74 per cent of the total cropped area on

diversified farms and 16.09 per cent on the non-diversified farms.

Table 1: Total cost of cultivation and its brake up of paddy on diversified farm. (Rs./ha)

S. No	Particulars	Size group of farms		
		Marginal	Small	Average
(A)		Operational cost		
1.	Human labour	7525.12 (17.65)	7931.64 (17.89)	7667.40 (17.35)
a.	Family labour	5132.02 (12.03)	5264.39 (11.87)	5878.35 (11.97)
b.	Hired labour	2393.10 (5.61)	2667.26 (6.02)	2489.05 (5.78)
2.	Bullock labour	240.30 (0.56)	280.60 (0.63)	254.40 (0.59)
3.	Tractor power	6732.13 (15.78)	7601.45 (12.15)	7036.39 (15.79)
4.	FYm (farm yard manure)	1670.13 (3.92)	1895.79 (4.28)	1749.11 (4.01)
5.	Fertilizer	2340.19 (5.49)	2576.37 (5.81)	2422.85 (5.62)
6.	Seed	1440.26 (3.38)	1590.49 (3.58)	1492.85 (3.48)
7.	Irrigation	2400.92 (5.63)	2512.31 (5.67)	2439.90 (5.65)
8.	Plant protection	434.31 (1.02)	500.00 (1.13)	457.30 (1.06)
9.	Interest on working capital	796.02 (1.80)	850.00 (1.92)	814.95 (18.88)
	Total operational cost	23539.57 (55.20)	15138.75 (56.71)	20599.28 (55.84)
B.	Rental value of land	10230.19 (23.99)	10230.19 (23.08)	10230.19 (23.60)
C.		Over head cost		
1.	Interest on fixed capital	4435.80 (10.40)	4481.35 (10.12)	4451.78 (10.28)
2.	Repairs of dead stock	2661.48 (6.24)	2688.81 (6.02)	2671.04 (6.17)
3.	Depreciation	1774.32 (4.16)	1792.54 (4.04)	1780.69 (4.11)
	Total over head cost	8871.60 (20.80)	8962.70 (20.22)	8903.56 (20.55)
	Total cost	42641.36 (100.00)	44331.64 (100.00)	43232.96 (100.00)

Table 2: Total cost of cultivation and its brake up of paddy of non diversified farms. (Rs/ha)

S. No	Particulars	Size group of farms		
		Marginal	Small	Average
(A)		Operational cost		
1.	Human labour	7348.06 (17.64)	7689.48 (17.72)	7478.94 (17.67)
a.	Family labour	5051.13 (12.13)	5169.62 (11.91)	5096.55 (12.04)
b.	Hired labour	2296.93 (5.51)	2519.86 (5.80)	2382.39 (5.63)
2.	Bullock labour	200.00 (0.48)	250.38 (0.58)	219.31 (0.52)
3.	Tractor power	6589.63 (15.82)	6839.09 (15.75)	6685.25 (15.65)
4.	FYm (farm yard manure)	1543.99 (3.71)	1751.31 (4.03)	1623.46 (3.84)
5.	Fertilizer	2249.67 (5.40)	2495.00 (5.75)	2343.71 (5.54)
6.	Seed	1380.40 (3.31)	1500.80 (3.45)	1426.55 (3.37)
7.	Irrigation	2370.68 (5.69)	2492.07 (5.74)	2417.21 (5.71)
8.	Plant protection	417.38 (1.09)	462.11 (1.06)	431.44 (1.02)
9.	Interest on working capital	733.32 (1.76)	821.81 (1.89)	767.24 (1.81)
	Total operational cost	22828.13 (54.81)	24302.05 (55.99)	23358.74 (55.27)
B.	Rental value of land	10230.19 (24.56)	10230.19 (23.57)	10230.19 (24.17)
C.		Over head cost		
1.	Interest on fixed capital	4295.63 (10.31)	4435.15 (10.21)	4349.12 (10.28)
2.	Repairs of dead stock	2577.38 (6.18)	2661.09 (6.13)	2612.26 (6.17)
3.	Depreciation	1718.24 (4.12)	1774.06 (4.08)	1741.49 (4.61)
	Total overhead cost	8591.25 (20.63)	8870.30 (20.43)	8791.71 (20.52)
	Total cost	41649.57 (100.00)	43402.54 (100.00)	42280.64 (100.00)

Table 1-2: shows that, on an average, total cost of cultivation of paddy came to Rs. 43232.96 per hectare on diversified farms as compared to Rs. 42280.64 on non-diversified farms due to higher investment on modern farm inputs, human labour, manures and fertilizer and irrigation. The average total operational cost on diversified farms being Rs. 20599.28 and on non-diversified farm Rs. 23358.74 per

hectare. The facilities of crop loan provided to diversified farmers resulted in higher investment on these farms.

Amongs different items of input, human labour accounted for the higher cost, followed by bullock labour. manures & fertilizers, irrigation and seed on diversified farms while human labour followed by bullock labour, irrigation, seed and manures and fertilizers were the main items of investment on non-diversified farms.

Table 3: Total cost of cultivation of paddy on diversified and non- diversified farm (Rs/farm).

S. No	Particulars	Size group of farms		
		Marginal	Small	Average
Diversified farms				
(A)	Operational cost			
1.	Human labour	5568.58	14911.48	8740.83
a.	Family labour	3797.67	9897.05	5903.31
b.	Hired labour	1770.89	5014.44	2837.52
2.	Bullock labour	177.82	527.52	290.021
3.	Tractor power	4981.77	14290.72	8021.48
4.	FYm (farm yard manure)	1235.89	3564.08	1993.98
5.	Fertilizer	1731.74	4843.57	2762.05
6.	Seed	843.79	2990.12	1701.83
7.	Irrigation	1776.68	4723.14	2781.49
8.	Plant protection	321.38	940.00	521.32
9.	Interest on working capital	589.05	1598.00	929.00
	Total operational cost	17419.28	28460.85	23483.18
B.	Rental value of land	7570.34	19232.75	11662.42
C.	Over head cost			
1.	Interest on fixed capital	3282.49	8424.93	5074.98
2.	Repairs of dead stock	1969.49	5054.96	3044.99
3.	Depreciation	1312.99	3369.97	2029.99
	Total over head cost	6564.98	16849.87	10149.97
	Total cost	31554.60	83343.48	49285.57
Non-diversified farms				
(A)	Operational cost			
1.	Human labour	4041.43	13225.90	7246.84
a.	Family labour	2778.12	8891.74	4940.97
b.	Hired labour	1263.31	4334.15	2305.86
2.	Bullock labour	110.00	430.65	211.59
3.	Tractor power	3624.29	11763.23	6479.05
4.	FYm (farm yard manure)	849.19	3012.25	1570.06
5.	Fertilizer	1237.31	4291.40	2267.84
6.	Seed	759.22	2581.37	1381.03
7.	Irrigation	1303.87	4286.36	2341.94
8.	Plant protection	229.55	794.82	420.4783
9.	Interest on working capital	403.32	1413.51	742.22
	Total operational cost	12555.47	41799.52	22657.98
B.	Rental value of land	5626.60	17595.92	9923.28
C.	Over head cost			
1.	Interest on fixed capital	2362.59	7628.45	4215.48
2.	Repairs of dead stock	1417.55	4577.07	2529.29
3.	Depreciation	945.03	3051.38	1686.18
	Total over head cost	4725.18	15256.91	8430.95
	Total cost	22907.26	74652.36	41012.22

Table 4: shows that, on an average, cost of cultivation of paddy came to Rs. 49285.61 per farm on diversified farms as compared to Rs. 41012.20 on non-diversified farms due to higher investment on modern farms inputs human labour, manures and fertilizers and irrigation. The average total operational cost of paddy per farm being Rs. 23483.18 on

diversified farm and on non-diversified farms, the average operational cost of production being Rs. 22658.33 per farm.

Yield and cost of production

The per hectare yield and per quintal cost of production for paddy on diversified and non-diversified farms have been calculated in table 4

Table 4: Total returns received from paddy on diversified and non-diversified farms (Rs./ha)

S. No	Particulars	Size groups of farms		
		Marginal	Small	Average
Diversified farms				
1.	Input cost	42641.36	44331.64	43232.96
2.	Total yield in qtl/ha	45.00	48.00	46.05
3.	Rate (in Rs/ctl)	1310.00	1310.00	1310.00
4.	Gross Income (main + by product)	70950.00	74880.00	72325.50
5.	Net Income	28308.64	30548.36	29092.54
6.	Cost of production/ctl.	1047.58	1023.57	1039.17
7.	Input-output ratio	1:1.51	1:1.53	1:1.52

Non-diversified farms				
1.	Input cost	41649.43	43405.54	42281.63
2.	Total yield in qtl/ha	43.00	46.00	44.08
3.	Rate (in Rs/ctl)	1310.00	1310.00	1310.00
4.	Gross Income (main + by product)	68330.00	75260.00	70824.80
5.	Net Income	26680.37	31854.46	28543.04
6.	Cost of production/ctl.	1079.49	1059.30	1072.22
7.	Input-output ratio	1:1.32	1:1.36	1:1.33

Table 5: Total returns received from paddy forms.(Rs/farm)

S. No	Particulars	Size groups of farms		
		Marginal	Small	Average
Diversified farms				
1.	Input cost	31554.60	83343.48	49285.57
2.	Total yield in qtl/ha	33.30	90.24	52.497
3.	Rate (in Rs/ctl)	1310.00	1310.00	1493.4
4.	Gross Income (main+by product)	52503.00	140774.40	82451.07
5.	Net Income	20948.39	57430.91	33165.5
6.	Cost of production/ctl.	775.20	1924.31	1184.66
7.	Input-output ratio	1:1.66	1:1.68	1:1.67
Non-diversified farms				
1.	Input cost	22907.18	74657.52	41013.18
2.	Total yield in qtl/ha	23.65	79.12	42.7576
3.	Rate (in Rs/ctl)	1310.00	1310.00	1270.7
4.	Gross Income (main+by product)	37581.50	129447.20	68700.06
5.	Net Income	14674.20	54789.67	27686.75
6.	Cost of production/ctl.	593.71	1821.99	1040.05
7.	Input-output ratio	1:1.64	1:1.66	1:1.65

Table 5: shows that paddy gave on an average yield of 46.05 quintals per hectare on diversified farms as compared to 44.08 quintals per hectare on non-diversified farms. The higher yield on diversified farms resulted to higher income and lower cost of production of per quintal on these farms. The average cost of production per quintal for paddy came to Rs. 1039.18 on diversified farms and Rs. 1072.22 on non-diversified farms. The gross and net income of paddy per hectare was Rs. 72325.50 and Rs. 29092.50 respectively on diversified farms as compared to Rs. 70824.80 and 28543.00 respectively on non-diversified farm.

It is quite clear from table V.A-14 that paddy gave an average yield of 52.49 quintal per farm on diversified farms as compared to 42.75 quintal per farm on non-diversified farms. The average cost of production per quintal for paddy came to Rs. 1184.66 on diversified farms and Rs. 1040.05 on non-diversified farms. The gross income of diversified farms came Rs. 82451.10 per farm and Rs. 68700.10 on non-diversified farms, and the net income of diversified farms found Rs. 33165.50 per farm and Rs. 27686.80 on diversified farms.

Table 7: Total cost according to different cost concepts (Rs/ha).

S. No	Particulars	Size group of farms		
		Marginal	Small	Average
Diversified farms				
1.	Cost A ₁	18407.55	19873.86	18920.75
2.	Cost A ₂	18407.55	19873.86	18920.75
3.	Cost B ₁	27279.15	28836.56	27824.24
4.	Cost B ₂	37509.34	39066.75	38054.43
5.	Cost C ₁	32411.17	34100.95	33002.59
6.	Cost C ₂	42641.36	44331.14	43232.78
7.	Cost C ₃	46905.50	48764.25	47556.06
Non-diversified farms				
1.	Cost A ₁	17777.00	19132.49	18264.97
2.	Cost A ₂	17777.00	19132.49	18264.97
3.	Cost B ₁	26368.25	28002.79	26956.68
4.	Cost B ₂	36598.44	38232.98	37186.87
5.	Cost C ₁	31419.38	33172.41	32050.47
6.	Cost C ₂	41649.57	43402.54	42280.63
7.	Cost C ₃	45814.52	47742.86	46508.72

Table 7: portray that average costs A₁, A₂, B₁, B₂, C₁, C₂, and C₃ were observed Rs. 18920.75, Rs. 18920.75, Rs. 27824.24, Rs. 38054.43, Rs. 33002.59, Rs. 43232.78, Rs. 47556.06 per hectare respectively on diversified farm. and

on non-diversified farms, the average costs A₁, A₂, B₁, B₂, C₁, C₂, and C₃ were observed Rs. 18264.97, Rs. 18264.97, Rs. 26956.68, Rs. 37186.87, Rs. 32050.47, Rs. 42280.63 and Rs. 46508.72 per hectare respectively.

Table 8: Total cost according to different cost concepts farm. (Rs/farm)

S. No	Particulars	Size group of farms		
		Marginal	Small	Average
Diversified farms				
1.	Cost A ₁	13621.58	37362.85	21569.66
2.	Cost A ₂	13621.58	37362.85	21569.66
3.	Cost B ₁	261552.00	54212.73	31719.64
4.	Cost B ₂	27756.91	73445.49	43382.05
5.	Cost C ₁	23894.26	64109.79	37622.96
6.	Cost C ₂	31554.61	83342.54	49285.37
7.	Cost C ₃	34710.07	91676.79	54213.91
Non-diversified farms				
1.	Cost A ₁	9777.35	32907.88	17717.03
2.	Cost A ₂	9777.35	32907.88	17717.03
3.	Cost B ₁	14502.53	48164.79	26147.98
4.	Cost B ₂	20129.14	65760.72	36071.27
5.	Cost C ₁	17280.66	57056.54	31088.96
6.	Cost C ₂	22907.26	74652.37	41012.22
7.	Cost C ₃	25197.98	82117.71	45113.46

Table 9: indicates the costs according to cost concepts. The average costs A₁, A₂, B₁, B₂, C₁, C₂, and C₃, observed Rs. 21569.66, Rs. 21569.66, Rs. 31719.64, Rs. 43382.05, Rs. 37622.96, Rs. 49285.37 and Rs. 54213.91 respectively per farm on diversified farm and on non-diversified, the average costs A₁, A₂, B₁, B₂, C₁, C₂, and C₃ were observed Rs. 17717.03, Rs. 17717.03, Rs. 26147.98, Rs. 36071.27, Rs. 31088.96, Rs. 41012.22 and Rs. 45113.46 respectively per farm.

Income measures approach

Income measures approach is a vital tool of estimating the degree of farm business achievements. It guides producer farmers about success and failure of farm enterprises, efficiency and productivity of resources, it is also helped in decision making organization, employment generation and operation of the farm as a whole. Gross income, farm business income, family labour income, net income and farm investment income are the key components of income measures approach.

Table 10: Size group wise per hectare different income. (Rs/ha)

S. No	Particulars	Size group of farms		
		Marginal	Small	Average
Diversified farms				
1.	Gross income	70950.00	74880.00	72325.50
2.	Net income	28308.64	30548.35	29092.54
3.	Family labour income	33441.32	35813.25	34271.50
4.	Farm business income	52542.45	55006.14	53404.74
5.	Farm investment income	47410.43	49741.75	48226.39
Non-diversified farms				
1.	Gross income	68330.00	75260.00	70824.80
2.	Net income	26680.30	31854.46	28543.00
3.	Family labour income	31731.56	37027.02	33637.93
4.	Farm business income	50553.00	56127.51	52559.82
5.	Farm investment income	45501.87	50957.89	47466.04

Table 10: reveals that average family labour income observed as Rs. 34271.50 per hectare on diversified farms, where as farm business income and farm investment income were observed Rs. 53404.74 and Rs. 48226.39 per hectare

respectively on diversified farms and the average family labour income, farm business income and farm investment income of the non-diversified farm were Rs. 33637.93 Rs. 52559.82 and Rs. 47466.04 per hectare respectively.

Table V.A-11: Size group wise per hectare different income. (Rs/farm)

S. No	Particulars	Size group of farms ⁸		
		Marginal	Small	Average
Diversified farms				
1.	Gross income	52503.00	140774.40	82451.07
2.	Net income	20948.39	57430.91	33165.49
3.	Family labour income	24746.58	67328.91	39069.50
4.	Farm business income	38881.41	103411.54	60881.41
5.	Farm investment income	35083.72	93514.49	54978.09
Non-diversified farms				
1.	Gross income	37581.50	12447.20	68700.06
2.	Net income	14674.20	54789.67	27686.71
3.	Family labour income	17452.36	63686.47	32628.79
4.	Farm business income	27804.15	96539.32	50983.03
5.	Farm investment income	25026.03	87647.57	46042.06

Table 9: reveals that average family labour income, farm business income and farm investment income observed Rs. 39069.50, Rs. 60881.41, Rs. 54978.09 per farm on diversified farms as compared to non-diversified farm the family labour income, farm business income and farm investment income were Rs. 32628.79, Rs. 50983.03 and Rs. 46042.06 per farm.

Conclusion

The study further suggested that the various optimum plans as obtained under different resources constraints can be made acceptable by the farmers if minimum price of the produce is assured through appropriate marketing arrangements of the produce. If specialized crops, livestock and poultry production are to be encouraged. In such areas, crop insurance for such high value crop should also be introduced in order to minimize the risk arising out on account of failure of crop or price fluctuation.

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