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Effect of subsidy on income of paddy growers in Northern Hills of Chhattisgarh

Somesh Prasad Singh and Sunil Kumar Singh

Abstract
The present study had been conducted in the Korea district of Chhattisgarh state to access the effect of farm subsidies on income of paddy farmers. The research had tried to understand that how subsidy is affecting the cost and returns from paddy cultivation in Korea district. For the, 100 farmers comprising 50 beneficiaries (receiving the subsidy) and 50 non-beneficiaries (receiving no subsidy) paddy cultivators had been selected randomly. The data on relevant variables were collected from both beneficiary and non-beneficiaries farmers through personal interview method. Simple tabular analysis and CACP cost concepts were employed to study the costs and return from paddy cultivation in the study area. The overall cost of cultivation of paddy for was found higher for beneficiaries farmers compared to non-beneficiaries farmers. The labour expense was the major component in total costs and accounted for 60.18 percent and 56.82 percent for beneficiary and non-beneficiary farmers, respectively. The expenses on variable resources were found to be 78.08 percent and 76.30 percent of total expenses for beneficiary and non-beneficiary farmers, respectively. The overall yield of paddy was observed to be higher for beneficiary farmers than non-beneficiary farmers. The net return was found to be higher for beneficiary farmers despite the higher cost of cultivation. The overall input-output ratio of paddy production was observed to be slightly higher for non-beneficiary farmers. The study indicated that the costs and returns from paddy cultivation was higher for beneficiary cultivators implying that agricultural subsidy had affected the income of farmers positively in the study area.

Keywords: Agricultural subsidy, costs, net income, paddy, returns

Introduction
The Indian economy relies heavily on agriculture and despite intensive modernization over the previous two decades, agriculture remains a source of pride in the country. In India, agriculture sector is the largest employer of workforce and contributed 18.8 percent of Indian GDP with the production of 308.65 million tons of food grain 2020-21 (Economic Survey, 2021-22). Since, agricultural production system is dominated by marginal and small farmers whose financial condition is not very sound. In such situation, government support to these farmers is a pre-requisite for agricultural growth.

But the small farms were often losers in the initial adoption stage of a new technology because the increased supply of agricultural products from large farms that have benefited from new technologies pushed the prices down (Fan *et al*., 2007) [2]. Among the several measures employed by government to support the financially poor farmers, subsidy occupies the central position because it reduces the costs and enables the farmers to utilize available modern technologies for agricultural production. Different economic, professional and official perspectives on the impact of agricultural subsidies exist. It is generally discussed that agricultural subsidies are concentrated geographically, concentrated on relatively few crops and few producers and several time fails to reach the targeted group (Sharma & Thaker, 2009) [7]. It is also argued that subsidies hinder farm investment, increases fiscal deficits (Kaur 2012) [5] and lead to financial resources misuse (Mahadeva, 2004) [6]. It is well documented that the more affluent farmers are able to harvest a disproportionately large part of the subsidies (Swaminathan *et al*., 2013) [8]. The annual subsidy disbursement of the Government of India has increased dramatically in recent years (Gulati & Narayanan, 2003) [3]. Subsidies, according to agricultural experts, are extremely advantageous to the agriculture sector's growth. The researchers have shown that subsidies have positive effect on agricultural growth (Gulati and Ferroni, 2018) [4]. But, it is feared that agriculture production and income of farmers would decline if subsidies are curtailed (Kaur, 2012) [5].

The government provides subsidies to the agriculture sector in different ways like fertilizer subsidy, machinery subsidy, subsidy for irrigation facilities, etc.

Materials and Methods

The Chhattisgarh state has been divided into three agro-climatic zones namely Chhattisgarh Plains, Baster Plateau and Northern Hills Zone. The Northern Hills Zone was selected purposively for present study due to its tribal farming community and their engagement in agricultural activities. The Northern Hills Zone is comprises of five districts *viz*., Korea, Surajpur, Surguja, Balrampur and Jashpur. The presented study had been conducted in the Baikunthpur block of Korea district beacause this block contribute majority of the area of total subsidy groups of farmers in the district. The stratified random sampling technique was adopted in the selection of final cultivators. Total 100 farmers; 50 beneficiary and 50 were non-beneficiary farmers had been selected using probability proportion method. The primary data had been collected during August 2021 from sampled households by conventional survey method using well design schedule through personal interview, The primary data on relevant variables like expenditure on labour, seed, fertilizer, irrigation, insecticides and pesticides, etc., were collected from the sampled paddy cultivators. The collected data were analyzed using tabular analysis and CACP cost concepts.

Results and Discussion

Subsidies availed by the sampled farmers in the study area: The lists of various subsidies provided by state/central government to the sampled farmers in the study area have been studied and present in the table 1. The tables 1 revealed that majority of farmer in the study area were benefited by Akti Bij Sanwardhan Yojna followed by Integrated Water Management Programme and Pradhan Mantri Fasal Bima Yojna accounting 35.86 percent, 28.97 percent and 17.24 percent, respectively. There were cases in which single farmers were receiving subsidies from more than one scheme.

Table 1: Government subsidies availed by the sampled farmers in the study area.

S.N.	Government subsidy	Total number of farmers
1	Agriculture Mechanization Sub Mission (Comp-3),	8(5.52)
2	Akti Bij Sanwardhan Yojna	42(35.86)
3	Pradhan Mantri Fasal Bima Yojna	42(17.24)
4	Integrated Water Management Programme	42(28.97)
5	National Food Security Mission (Oil Seed)	8(6.90)
7	National Food Security Mission (Rice)	16(5.52)
8	Total	145(100)

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

Costs of cultivation of paddy

The costs of paddy cultivation for beneficiary and non-beneficiary farmers had been presented in the Table 2 and table 3. The table 2 indicated that overall cost of paddy cultivation in the case of beneficiary farmers was estimated to be Rs. 55802.60 ha.$^{-1}$. The cost of paddy cultivation was found highest for marginal farmers (Rs. 56509.67 ha.$^{-1}$) and lowest cost of paddy cultivation was found for large farmers (Rs. 55188.19 ha.$^{-1}$). The expenditure on variable resources was found to be Rs. 43568.62 ha.$^{-1}$ accounting 78.08 percent of the total cost of paddy cultivation. The labour cost was the major cost component among variable costs and estimated to be Rs. 33581.55 ha.$^{-1}$ accounting 60.18 percent of the total costs. The expenditure on fixed cost was found to be Rs. 12233.98 ha.$^{-1}$ constituting 21.92 percent of the total cost of paddy cultivation. The perusal of the table 3 revealed that overall cost of paddy cultivation for non-beneficiary farmers was estimated to be Rs. 51530 ha.$^{-1}$. The highest cost of paddy cultivation was found for small farmers (Rs. 52906.04 ha.$^{-1}$) and it was observed to be lowest for medium farmers (Rs. 50287.44 ha.$^{-1}$). The expenditure on variable resources was found to be Rs. 39318.66 ha.$^{-1}$ accounting 76.30 percent of total cost of paddy cultivation. The major expenses among variable resources were on labour and found to be Rs. 29279.87 ha.$^{-1}$ accounting 56.82 percent of total expenses. The expenditure on fixed resources was estimated to be Rs. 12211.34 ha.$^{-1}$ constituting 23.70 percent of total cost of paddy cultivation. The cost of paddy cultivation for beneficiary farmers was observed to be higher than non-beneficiary farmers. The cost of paddy cultivation of non-beneficiary farmers was lower due to the fact that non-beneficiary farmers has less investment on fixed assets like farm machinery and equipment as they are costly and no subsidy was provided to them on these assets.

Table 2: Costs of paddy cultivation across various land holding categories. (Rs/ha.)

Beneficiaries farmers						
S.No	Particulars/ input cost	Land holdings category				
		Marginal farmer	Small farmer	Medium farmer	Large farmer	overall
A	Operating Expenses					
1	Family labour	1254.97 (2.22)	1268.46 (2.29)	944.78 (1.68)	988.33 (1.79)	1126.78 (2.02)
2	Hired labour	26568.45 (47.02)	26273.48 (47.50)	27168.82 (48.20)	26430.87 (47.89)	26579.02 (47.63)
3	Machine labour	4501.32 (7.97)	4231.33 (7.65)	4466.05 (7.92)	4362.82 (7.91)	4379.32 (7.85)
4	Bullock labour	1316.40 (2.33)	1576.34 (2.85)	1574.40 (2.79)	1505.09 (2.73)	1496.43 (2.68)
	Total labour expenses	33641.14 (59.53)	33349.61 (60.29)	34154.05 (60.59)	33287.11 (60.32)	33581.55 (60.18)
5	Seed	3082.08 (5.45)	2669.33 (4.83)	2515.79 (4.46)	2299.35 (4.17)	2645.82 (4.74)
6	Manure	2030.76 (3.59)	1807.64 (3.27)	1782.07 (3.16)	1765.90 (3.20)	1845.54 (3.31)
7	Fertilizers	2729.99 (4.83)	2631.83 (4.76)	2823.29 (5.01)	2835.08 (5.14)	2746.29 (4.92)
8	Irrigation	686.81 (1.22)	716.70 (1.30)	705.01 (1.25)	738.01 (1.34)	712.07 (1.28
9	Miscellaneous	820.94 (1.45)	800.02 (1.45)	829.92 (1.47)	813.86 (1.4)	814.94 (1.46)
10	Interest on working capital	1231.41 (2.18)	1200.03 (2.17)	1244.88 (2.21)	1220.79 (2.21)	1222.41 (2.19)

	Total Variable cost	44223.13 (78.26)	43175.16 (78.06)	44055.01 (78.15)	42960.10 (77.84)	43568.62 (78.08)
B	Fixed Expenses					
1	Depreciation	131.55 (0.23)	39.72 (0.07)	153.05 (0.27)	124.84 (0.23)	107.12 (0.19)
2	Interest on fixed capital	2154.99 (3.81)	2097.18 (3.79)	2162.40 (3.84)	2103.25 (3.81)	2126.86 (3.81)
3	Rental value of owned land	10000 (17.70)	10000 (18.08)	10000 (17.74)	10000 (18.12)	10000 (17.92)
	Total fixed cost	12286.54 (21.74)	12136.90 (21.94)	12315.45 (21.85)	12228.09 (22.16)	12233.98 (21.92)
C	Total cost (A+B)	56509.67 (100)	55312.06 (100)	56370.46 (100)	55188.19 (100)	55802.60 (100)

(Figures in parenthesis indicate the percentage to the total cost.)

Table 3: Costs of paddy cultivation across various land holding categories. (Rs /ha.)

Non- Beneficiaries farmers					
S.No.	**Particulars/ input cost**	**Land holdings category**			
		Marginal farmers	**Small farmers**	**Medium farmers**	**overall**
A	Operating Expanses				
1	Family labour	998.46 (1.91)	828.14 (1.57)	577.71 (1.15)	769.05 (1.49)
2	Hired labour	22958.75 (44.02)	23638.73 (44.68)	21673.90 (43.10)	22570.21 (43.80)
3	Machine labour	4334.00 (8.31)	4438.40 (8.39)	4458.11 (8.87)	4415.75 (8.57)
4	Bullock labour	1476.00 (2.83)	1578.60 (2.98)	1526.41 (3.04)	1524.86 (2.96)
	Total labour expenses	29767.21 (57.07)	30483.87 (57.62)	28236.13 (56.15)	29279.87 (56.82)
5	Seed	2465.20 (4.73)	2441.99 (4.62)	2591.47 (5.15)	2514.72 (4.88)
6	Manure	1844.81 (3.54)	1791.08 (3.39)	1891.78 (3.76)	1851.51 (3.59)
7	fertilizers	2874.38 (5.51)	2825.61 (5.34)	2822.49 (5.61)	2838.87 (5.51)
8	Irrigation	1000.00 (1.92)	1025.64 (1.94)	952.38 (1.89)	985.71 (1.91)
9	Miscellaneous	745.74 (1.43)	760.99 (1.44)	721.85 (1.44)	739.19 (1.43)
10	Interest in working capital	1118.61 (2.14)	1141.49 (2.16)	1082.78 (2.15)	1108.79 (2.15)
	Total Variable cost	39815.95 (76.33)	40470.67 (76.50)	38298.88 (76.16)	39318.66 (76.30)
B	Fixed Expanses				
13	Depreciation	381.42 (0.73)	445.56 (0.84)	106.86 (0.21)	277.29 (0.54)
14	Interest on value of owned capital assets	1962.51 (3.76)	1989.81 (3.76)	1881.70 (3.74)	1934.05 (3.75)
15	The rental value of owned land	10000.00 (19.17)	10000.00 (18.90)	10000.00 (19.89)	10000.00 (19.41)
16	Total Fixed Expenses	12343.93 (23.67)	12435.37 (23.50)	11988.56 (23.84)	12211.34 (23.70)
C	Total Expenses (A+B)	52159.88 (100.00)	52906.04 (100.00)	50287.44 (100.00)	51530.00 (100.00)

(Figures in parenthesis indicate the percentage to the total cost.)

Estimation of the CACP cost concept: - The various CACP cost concepts had been estimated for both beneficiary and non-beneficiary farmers and presented in the Table 4. The table 4 clearly showed that the overall Cost A_1, Cost A_2, Cost B_1, Cost B_2, Cost C_1, Cost C_2, and Cost C_3 in case of beneficiary farmers were found to be Rs. 42441.85, Rs. 42441.85, Rs. 44675.83, Rs. 54675.83, Rs. 45802.61, Rs. 55802.61 and Rs. 61382.87, respectively. The Cost A_1 was found to be highest for medium farmers (Rs. 43110.22) and it was observed to be lowest for small farmers (Rs. 41906.71). The highest Cost B_1 and Cost B_2 was found for medium farmers and estimated to be Rs. 45425.67 and Rs. 55425.67, respectively while lowest Cost B_1 and Cost B_2 was observed for small farmers and estimated to be Rs. 44043.61 and Rs. 54043.61, respectively. The Cost C_1, Cost C_2, and Cost C_3 was highest and found to be Rs. 46509.67, Rs. 56509.67 and Rs. 62160.63 respectively for marginal farmers and it was lowest and estimated to be Rs. 45188.19, Rs. 55188.19 and Rs. 60707.01, respectively for large farmers. In case of non-beneficiary farmers, overall Cost A_1, Cost A_2, Cost B_1, Cost B_2, Cost C_1, Cost C_2, and Cost C_3 were found to be Rs. 38549.62, Rs. 38549.62, Rs. 40760.96, Rs. 50760.96, Rs. 41530.01, Rs. 51530.01 and Rs. 56683.01 respectively. The highest Cost A_1, Cost A_2, Cost B_1, Cost B_2, Cost C_1, Cost C_2, and Cost C_3 was found for small farmers and estimated to be Rs. 39642.53, Rs. 39642.53, Rs. 42077.90, Rs. 52077.90, Rs. 42906.04, Rs. 52906.04 and Rs. 58196.64, respectively and lowest Cost A_1, Cost A_2, Cost B_1, Cost B_2, Cost C_1, Cost C_2, and Cost C_3 was found for medium farmer and estimated to be Rs. 37721.17, Rs. 37721.17, Rs. 39709.73, Rs. 49709.73, Rs. 40287.44, Rs. 50287.44 and Rs. 55316.19, respectively. From the analysis, it was found that the costs *viz*. Cost A_1, Cost A_2, Cost B_1, Cost B_2, Cost C_1, Cost C_2, and Cost C_3 was highest for beneficiary farmers than of non-beneficiary farmers.

Table 4: Cost of paddy cultivation as per the CACP cost concept (Rs. /ha.).

Beneficiaries farmers						
S.N.	**Particulars**	**land holdings category**				
		Marginal	**Small**	**Medium**	**Large**	**Overall**
1	Cost A_1	42968.16	41906.71	43110.22	41971.77	42441.85
2	Cost A_2	42968.16	41906.71	43110.22	41971.77	42441.85
3	Cost B_1	45254.70	44043.61	45425.67	44199.86	44675.83
4	Cost B_2	55254.70	54043.61	55425.67	54199.86	54675.83
5	Cost C_1	46509.67	45312.07	46370.45	45188.19	45802.61
6	Cost C_2	56509.67	55312.07	56370.45	55188.19	55802.61
7	Cost C_3	62160.63	60843.28	62007.50	60707.01	61382.87
Non-Beneficiaries farmers						
1	Cost A_1	38817.49	39642.53	37721.17	-	38549.62
2	Cost A_2	38817.49	39642.53	37721.17	-	38549.62

3	Cost B_1	41161.42	42077.90	39709.73	-	40760.96
4	Cost B_2	51161.42	52077.90	49709.73	-	50760.96
5	Cost C_1	42159.88	42906.04	40287.44	-	41530.01
6	Cost C_2	52159.88	52906.04	50287.44	-	51530.01
7	Cost C_3	57375.87	58196.64	55316.19	-	56683.01

Return from paddy production: The return from paddy production for beneficiary and non-beneficiary farmers has been estimated and presented in the Table 5. The Table 5 clearly showed that overall gross income, net income, farm business income, family business income and farm investment income per ha. was found to be Rs. 119631.50, Rs. 63828.89, Rs. 77189.66, Rs. 64955.67 and Rs. 76062.09, respectively, for beneficiary farmers. The highest gross income (Rs. 122175.00), net income (Rs. 66862.9), farm business income (Rs. 80268.3), family business income (Rs. 68131.4), and farm investment income (Rs. 78999.8) was found for small farmers, and lowest gross income (Rs.115850.00), net income (Rs. 59479.5), farm business income (Rs. 72739.8), family business income (Rs. 60424.3), and farm investment income (Rs. 71795.00) was found for medium farmers. The highest input output ratio was observed 2.21 for small farmers and lowest input output ratio was 2.06 for medium farmers. In case of non-beneficiary farmers, overall gross income, net income, farm business income, family business income and farm investment income per ha. was found to be Rs. 111280.50, Rs. 59750.5, Rs. 72730.9, Rs. 60519.54 and Rs. 71961.8, respectively. The highest gross income (Rs.117750.00), net income (Rs. 64844), farm business income (Rs. 78107.5), family business income (Rs. 65672.10), and farm investment income (Rs. 77279.33) was found for small farmers, and lowest gross income (Rs.107325.00), net income (Rs. 57037.6), farm business income (Rs. 69603.8), family business income (Rs. 57615.3), and farm investment income (Rs. 69026.1) was found for medium farmers. The highest input output ratio was observed to be 2.23 for small farmers and lowest input output ratio was observed to be 2.13 for medium farmers. It was observed that overall input output ratio for both beneficiary and non-beneficiary farmers of paddy came to be 2.14 and 2.16, respectively. The input output ratio of beneficiary farmers was found to be lower than non-beneficiary farmers.

Table 5: Return from paddy production for different categories of farmers

Beneficiaries farmers						
		Landholding category				
S.No.	**Particulars**	**Marginal**	**Small**	**Medium**	**Large**	**Overall**
1	Average Yield	47.62	48.87	46.34	48.2	47.85
2	Average Price	2500	2500	2500	2500	2500
3	Gross Income	119050	122175	115850	120500	119632
4	Net Income	62540.3	66862.9	59479.5	65311.8	63828.9
5	Farm Business Income	76081.8	80268.3	72739.8	78528.2	77189.7
6	Family Business Income	63795.3	68131.4	60424.3	66300.1	64955.7
7	Farm Investment	74826.9	78999.8	71795	77539.9	76062.9
8	Input-Output Ratio	2.11	2.21	2.06	2.18	2.14
Non-beneficiaries farmers						
1	Average Yield	44.59	47.1	42.93	-	44.51
2	Average Price	2500	2500	2500	-	2500
3	Gross Income	111475	117750	107325	-	111280.5
4	Net Income	59315.1	64844	57037.6	-	59750.5
5	Farm Business Income	72657.5	78107.5	69603.8	-	72730.9
6	Family Business Income	60313.6	65672.1	57615.3	-	60519.5
7	Farm Investment	71659.1	77279.3	69026.1	-	71961.8
8	Input-Output Ratio	2.14	2.23	2.13	-	2.16

Relative change in costs, returns and profits from paddy cultivation: The relative change in the costs, returns and profits from paddy production in the study area have been computed and presented in the table 6. The relative change in the costs, returns and profits from paddy production have been computed in the comparison to the beneficiary group of farmers. As perusal of the table 6 indicated that overall cost of paddy cultivation for beneficiary farmers were higher by 8.29 percent as compared to non-beneficiary farmers. The difference in cost of cultivation was found highest for medium farmers (12.10 percent) and it was lowest for small farmers (4.55 percent). The overall yield of paddy was found to be higher for beneficiary farmers by 7.50 percent than yield of paddy for non-beneficiary farmers. The difference in paddy yield was found to be highest for medium farmers (7.94 percent) while lowest difference was observed for small farmers (3.76 percent). Similarly, overall gross income from paddy production was estimated to be higher for beneficiary farmers by 7.50 percent compared non-beneficiary farmers. The highest difference in gross income from paddy production was found for medium farmers (7.94 percent) and lowest difference was observed for small farmers 3.76 percent). The difference of net income from paddy production for overall category of beneficiary farmers was estimated to be higher by 6.83 percent compared to non-beneficiary farmers. The highest difference in net income from paddy production was observed for marginal farmers (5.44 percent) while it was found lowest for small farmers (3.11 percent).

Table 6: Relatives comparison of cost and return from paddy production.

S.No.	Particulars	Beneficiaries farmers	Non beneficiaries farmers	Change
A	**Cost of paddy cultivation (Rs/ha.)**			
1	Marginal farmers	56509.7	52159.9	4349.79 (8.34)
2	Small farmers	55312.1	52906	2406.02 (4.55)
3	Medium farmers	56370.5	50287.4	6083.02 (12.10)
4	Overall	55802.6	51530	4272.6 (8.29)
B	**Yield of paddy production (Rs/ha.)**			
1	Marginal farmers	47.62	44.59	3.03 (6.80)
2	Small farmers	48.87	47.1	1.77 (3.76)
3	Medium farmers	46.34	42.93	3.41 (7.94)
4	Overall	47.85	44.51	3.34 (7.50)
C	**Gross income from paddy production (Rs/ha.)**			
1	Marginal farmers	119050	111475	7575 (6.80)
2	Small farmers	122175	117750	4425 (3.76)
3	Medium farmers	115850	107325	8525 (7.94)
4	Overall	119632	111281	8351.5 (7.50)
D	**Net income from paddy production (Rs/ha.)**			
1	Marginal farmers	62540.3	59315.1	3225.2 (5.44)
2	Small farmers	66862.9	64844	2018.9 (3.11)
3	Medium farmers	59479.5	57037.6	2441.9 (4.28)
4	Overall	63828.9	59750.5	4078.4 (6.83)

Figure in parentheses indicate percentage change to non-beneficiary farmers.

Conclusions

The farm subsidy is a key factor in the determination of the type of crop grown by farmers and technological adoption by the farmer especially in backward area. Subsidy has the capacity to not only reduce the cost but also increase the productivity of crops by adopting the most suitable production technology. In this study, it was observed that Akti Bij Sanwardhan Yojna, Integrated Water Management Programme and Pradhan Mantri Fasal Bima Yojna together benefitted the majority of farmers. The cost of paddy cultivation was higher for beneficiary farmers compared to non-beneficiary farmers. This may happened due to high investment by beneficiary farmers on fixed assets. This high investment on fixed assets had paid off the beneficiary farmers through increased productivity. The major expenditure was made on labour by both beneficiary and non-beneficiary farmers. The return from paddy cultivation was higher for beneficiary farmers compared to the non-beneficiary farmers. This higher income indicated that farm subsidy has positive effect on farmer's income in the study area.

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