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Estimate the cost of cultivation of paddy in Dhamatari District of Chhattisgarh

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Abstract
The present study was undertaken with a view to estimate the economics of production and processing of paddy in Dhamtari district of Chhattisgarh state. Random sample of 150 farmers has drawned of total population of selected 3 villages. Two processing units for each of processing unit of raw rice and parboiled rice has been selected. Paddy was the major crops grown in the study area. Cost of paddy cultivation per hectare were calculated at Rs. 48780.99, Rs. 49551.46,Rs. 52225.06 and Rs. 50129.74, and Rs. 50116.07 for marginal farms, small farms, medium farms, large farms and overall respectively, showing a growing trend with growing farm size and a positive correlation with farm size. More lenient outlook should be adopted by the Government for providing liscence to the entrepreneurs for paddy processing mills and adequate credit facilities should be provided for encouraging the establishment of paddy processing mills in the study area.

Keywords: Cost, cultivation, farmers, paddy, processing

Introduction
Paddy has significant share in districts economy. So production and processing are the most significant elements of the district's development process. This is evident from the reality that growth essentially means greater productive activity in the economy. There are various types of rice processing industries *viz*., zhuller mills, Huler-cum-sheller mills, Sheller mills and modern mills. Nearly 60% head yield is obtained with 10-25 per cent broken and admixture of bran and husk in traditional method whereas with modern techniques, 68-72% head rice with 5-7 per cent broken and better utilizable products. Dhamtari is one of the selected growth corridor in the Chhattisgarh state, detailed information on difficulties in rice production, The way in which the market presently operates and the issues and scope of the processing scheme are identified enables governmental and non-governmental organizations design suitable intervention steps. In addition, the document would also serve as a reference for scientists to undertake comparable or associated job elsewhere in the nation. Because Agricultural Research Center has been allocated or nominated to coordinate the state and nation domestic rice research job, this study will also partly fill the gap in this respect. During post-harvest activities, losses in paddy and rice are generally about 10 percent of field manufacturing. Therefore, it is essential to implement appropriate technology to improve the amount and quality of paddy and rice after harvesting the crop. Post production involves all activities from harvesting up to grading and interdependent phases. (Gautam *et al.* 1988) [1].

Material Methods
Three phases have been implemented stratified random sampling methods with first unit development block, villages as second unit and farm homes as the ultimate or third unit of research enquiry. A list of paddy growing farmers, along with their cultivated area was prepared. A farmer having 25 per cent or more of their cultivated area under paddy was treated as paddy growers. On the basis of their farm holding sizes, households were categorized under 4 categories Marginal (less than 1 ha), Small (1 to 2 ha), Medium (2 to 4 ha), Large (Above 4 ha).

Cost of cultivation
The data pertaining to the cost of cultivation of the crops are those which are generally adopted in the farm management studies.

a) Cost A1: It includes

1. Value of hired human labour.
2. Value of hired and owned bullock labour.
3. Value of hired and owned machine labour.
4. Value of seed (both farm seed and purchased).
5. Value of manures (owned and purchased).
6. Cost of fertilizers.
7. Plant protection charges (insecticide/pesticide).
8. Irrigation charges.
9. Land revenue.
10. Interest on working capital.
11. Miscellaneous expenses.
12. Depreciation.

Family labours were charged at the rate of hired labour charges prevailing in the region. Owned bullock labour is taken on the basis of hire rate prevailing in the village.

b) **Cost A2**: Cost A1 + rent paid for leased in land.
c) **Cost B1**: Cost A1 + interest on fixed capital (excluding land).
d) **Cost B2**: Cost B1 + rental value of owned land + rent for leased in land.
e) **Cost C1**: Cost B1 + imputed value of family labours.
f) **Cost C2**: Cost B2 + imputed value of family labours.
g) Cost C3: Cost C2 + 10 percent of cost C2 as management cost.

- **Interest on working capital**

It was calculated at @ 4% for the half of the crop period.

- **Rental value of owned land**

It was calculated on the basis of prevailing rates in the sampling villages which was one fifth of the gross product.

- **Depreciation**

It represented the amount by which a farm resources decreased in value a result of cause other than a change in the general price of the item straight line method was used for calculating the depreciation:

$$\text{Depreciation} = \frac{\text{Purchased price of the assets- junk value} \times 100}{\text{No. of useful years of life (expected life)}}$$

Result discussion

The cost of cultivation of paddy per hectare. It was estimated at Rs. 50116.07 on average farm size. It were calculated Rs. 48780.99, Rs. 49551.46,Rs. 52225.06 and Rs. 50129.74 for marginal, small, medium and large farms respectively, exhibiting increasing trend with increasing size of farms, witnessing a positive correlation with the size of farms. Total cost incurred in cultivation of paddy per hectare was divided into two major components *viz*. Operational cost (A) and fixed cost (B). Operational cost was further divided into two parts, material cost and labour cost. Cost of machinery was costliest item in each category of farm size it were calculated Rs.11100.07, Rs.9532.71, Rs.9100.05, Rs.11165.67, and Rs.10437.65 for marginal, small, medium, large and average farm size respectively. Second important cost calculated among operational cost was cost of fertilizer which was Rs. 5515.31 for average farm size. Labour cost includes human labour cost (Family labour + hired labour) and machinery or bullock labour cost. It has been noted that employed labor costs increase with growing farm size while family labor costs increase only to medium farm size but decrease with big sizes indicating less interest in working outside the home as their status does not allow them to operate on the farm. It was also noted that the share of family bullock / machinery costs increased while the share of hired bullock equipment costs decreased indicating that farmers retained their own farm equipment as the size of the farm increased. Rental value of owned land was the costliest item amounting to Rs. 12000.00 among fixed cost it was high due to very high demand and scarcity of the land in the locality.

Table 4.1: Cost of cultivation of paddy by various size of farms

S. No	Input Factor	Marginal (<1 ha)	Small (1-2 ha)	Medium (2-4 ha)	Large (>4 ha)	Overall
	Operational Cost					
I.	**Material Cost**					
1	Seed	2804.44 (5.75)	2054.96 (4.15)	4714.27 (9.03)	2198.52 (4.39)	2836.38 (5.66)
2	Manure	2480.45 (5.08)	1911.74 (3.86)	870.55 (1.67)	545.59 (1.09)	1557.98 (3.11)
3	Fertilizer	6503.11 (13.33)	4780.69 (9.65)	4311.49 (8.26)	5596.09 (11.16)	5515.30 (11.01)
4	Plant Protection Chemical	6051.12 (12.40)	3073.4 (6.20)	5956.256 (11.40)	5127.545 (10.23)	5183.73 (0.07)
5	Irrigation Charges	173.32 (0.36)	154.33 (0.31)	1205.38 (2.31)	992.27 (1.98)	574.54 (1.15)
6	Machinery Charges	11100.07 (22.75)	9532.71 (19.24)	9100.05 (17.42)	11165.67 (22.27)	10437.65 (20.8)
	Sub Total	29112.14 (59.68)	21507.86 (43.41)	26158.03 (50.09)	25625.71 (22.27)	26105.6 (41.82)
II	**Labor Cost**					
1	Family Labor	3332.44 (6.83)	7516.88 (15.17)	4740.45 (9.08)	1232.12 (2.46)	3876.25 (7.73)
2	Hired Labor	2056.77 (4.22)	6529.14 (13.18)	7071.61 (13.54)	8966.13 (17.89)	5713.32 (11.40)
3	Miscellaneous Charges	120 (0.25)	110 (0.22)	160 (0.31)	200 (0.40)	146.53 (0.29)
4	Interest on Working Capital	1164.48 (2.39)	860.31 (1.74)	1046.32 (2.00)	1025.02 (2.04)	1272.75 (2.54)
	Total Cost A	35785.84 (73.36)	36524.21 (73.71)	39176.41 (75.01)	37048.99 (73.91)	37114.47 (74.06)
III	**Fixed Cost**					
1	Land Revenue	25 (0.05)	25 (0.05)	25 (0.05)	25 (0.05)	25 (0.05)
2	Rental Value of owned land	12000 (24.60)	12000 (24.22)	12000 (22.98)	12000 (23.94)	12000 (23.94)
3	Depreciation Value	120 (0.25)	150 (0.30)	170 (0.33)	200 (0.40)	126.03 (0.025)
4	Interest on fixed capital @7%	850.15 (1.74)	852.25 (1.72)	853.65 (1.63)	855.75 (1.71)	850.57 (1.70)
	Total Cost B	12995.15 (26.64)	13027.25 (26.29)	13048.65 (24.99)	13080.75 (26.09)	13001.6 (25.94)
	Total Cost A+B	48780.99 (100)	49551.46 (100)	52225.06 (100)	50129.74 (100)	50116.07 (100%)
	Main Product (Q)	68.5	69	70	72	69.80
	Return	106175	106950	108500	111600	108199
	By Product (Q)	89	90	93	98	92.32
	Return	31150	31500	32550	34300	32314.02
	Gross Income	137325	138450	141050	145900	140513.1
	Net Income	88544.01	88898.54	88824.94	95770.26	127511.5
	B:C Ratio	1:1.81	1:1.79	1:1.70	1:1.91	1:1.81

Table 4.2: Different Net over income over different cost among various categories of farms:

S. No	Particulars	Marginal	Small	Medium	Large	Overall
1	Income over cost A1	100349.7	101040.5	61625.85	107801	102100.8
2	Income over cost A2	100349.7	101040.5	61625.85	107801	107801
3	Income over cost B1	99499.53	100188.2	60772.2	106945.2	101250.3
4	Income over cost B2	87499.53	88188.23	48772.2	94945.23	94945.23
5	Income over cost C1	96167.08	92671.34	56031.75	105713.1	105713.1
6	Income over cost C2	84167.08	80671.34	44031.75	93713.11	93713.11
7	Income over cost C3	78851.29	74893.48	34329.9	88494.42	88494.42

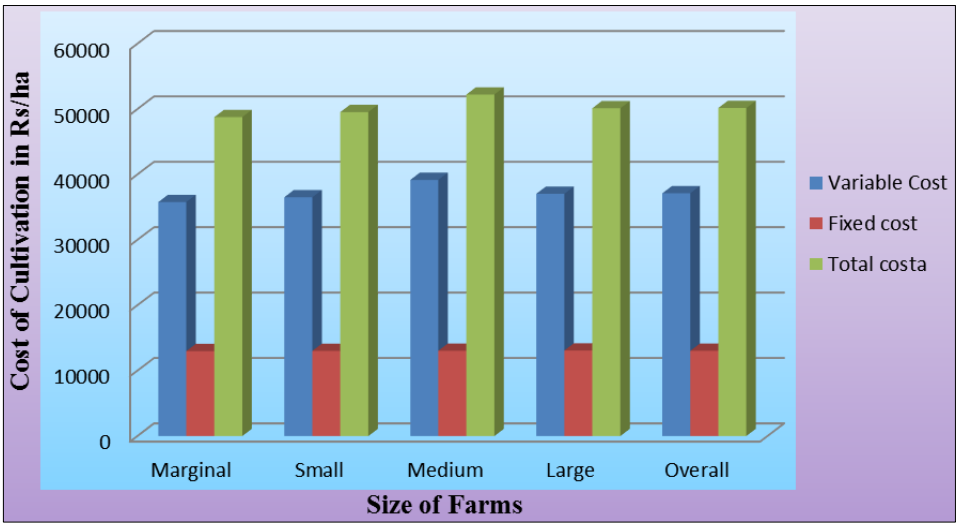

Fig 4.1: Cost of cultivation of paddy by various size of farms

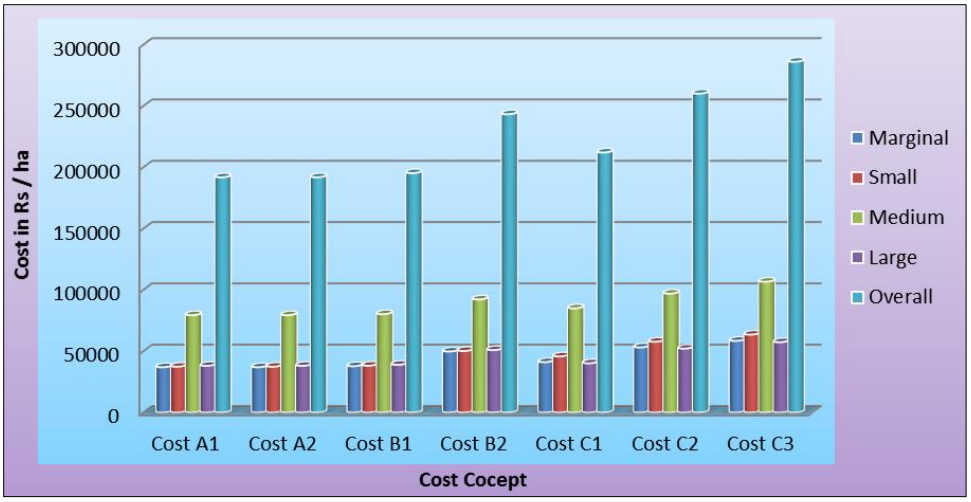

Fig 4.2: Cost concepts in paddy Cultivation

Conclusion

Paddy cultivation recorded important favorable development in the study era, i.e. 0.83% in the district of Dhamtari and 0.19% in the country. The productivity of paddy also recorded a non-significant favorable growth rate in the district and Chhattisgarh State throughout the study period. 0.85 per cent growth rate productivity in paddy was observed in Dhamtari district which is much higher than the productivity growth rate (0.20 per cent) of paddy in the state. On average farm size, the price of growing paddy per hectare was estimated at Rs.286155.9. Rs.58473.71,Rs were calculated. 63556.52,Rs. 106720.1 and Rs. 57405.58 for marginal, tiny, medium and large farms respectively, showing a growing trend with growing farms and a positive correlation with farms ' size. On average net income over Cost A1, Cost A2, Cost B1, CostB2, Cost C1, Cost C2, and Cost C3 were Rs.289966.3, Rs.289966.3, Rs.

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