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Production, marketing and processing of black rice: A case study of Ojashvi farmer producer organization, Kurud district Dhamtari

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Abstract

The study aims to examine the production, marketing and processing of black rice – a case study of Ojashvi farmer producer organization, Kurud, district Dhamtari of Chhattisgarh. The primary data was collected for year 2019-20 from sampled households through personal interview method. On an average cost of cultivation per hectare of black rice was calculated Rs. 50183 per farms. The highest cost was observed in Machinery Charges and labour charges. Net income of black rice production was 68134 Rs/ha. On an average yield of black rice was 33 Qtl/ha. On an average the benefit – cost ratio came to 1:1.34 on the sample farms. On an average cost of processing per quintal of black rice was calculated Rs. 112/Qtl. Net profit from per quintal of processing is Rs 1763/Qtl. On an average marketable surplus was observed 67.27%. FPO play a major role in the marketing of black rice, 30.69% black rice sold through the FPO.

Keywords: marketing, black rice, Ojashvi farmer producer organization

Introduction

The most preferred rice is Black rice is the origin of the common rice spp. (*Oryza sataiva*) and the scientific name of black rice is (*Zizania agatica*). In the different part of the world black rice is known as purple rice, heaven rice, forbidden rice, imperial rice, prized rice and king's rice. In Manipur black rice is known as chak hao ambi which mean delicious black rice. In Odisha black rice is known as a kala bati (kala means black and bati means rice) and in Chhattisgarh black rice is known as kala dhan.

In 21 century black rice is consider as supper food because black rice is reach source of essential amino acid, like lysine, tryptophan: vitamin such as vitamin B2, folic acid and it is also a good source of mineral including iron, zink, calcium, and phosphorus. It is a also a good source of fiber and plant based protein. Black rice has highest amount of antioxidant, protein dietary fiber as compared to other variety of rice. Known day black rice become more popular because of its health benefit Black rice prevent many health disease such as heart disease, cancer, diabetes, high blood pressure and extend the quality of life. Several research prove that black rice play a major role to maintain the health and prevent the disease.

Material Methodology

Ojashvi, farmer producer organization (FPO) located at kurud district Dhamtari of Chhattisgarh will be selected purposely. In Ojashvi farmer producer organization total number of farmer is 537 and this farmer came from different villages, total no of village is 65. Out of 65 villages 7 villages are selected for the study. They are Hatband, Rakhi, Banajri, Navagaon, Charmudiya, Bhusrega, Bagod. In these study 56 respondent was selected randomly for the study

The list of black rice grower, along with their cultivated area, based on the size of the farm, households were classified into 4 categories Marginal (less than 1 ha), Small (1 to 2 ha), Medium (2 to 4 ha), Large (Over 4 ha). 56 farmer were selected randomly from different villages, including the following number of farmers belonging to different categories Marginal farmer 6 (10.71%), Small farmer 9 (16.07%), Medium farmer 22 (39.28%), Large farmer 19 (33.92%)

Data collection**Primary Data**

Primary information was obtained from selected farmers through private interviews using a pre-tested and well-structured schedule for research purposes.

Secondary Data

Secondary data were obtained from various sources such as the District Statistical Office, Deputy Director of Agriculture, District Food Supply and Consumer Protection Office, Block Development Office.

Cost concept**Cost of cultivation**

Cost of cultivation refers to the total expenses incurred in cultivation one hectare black rice.

Cost of cultivation = total fixed cost + total variable cost

Fixed cost

Fixed cost are those cost that do not vary with output and typical include rents, insurance, depreciation and set-up cost.

Variable cost

Variable cost are the cost that do vary with output, it is also called direct costs. Example seed cost, fertilizer, plant protection cost etc.

Cost of production

Cost of production refers to the total cost incurred by a farm to produce a one quintal of black rice.

Cost of production = cost of cultivation / total production

Profitability concept**(A) Gross income**

Gross income defined as total value of main product and by product.

Gross income = physical production price / quintal

(B) Net income

It is defined as gross income minus total cost.

Net Income = Gross Income - Total Cost.

C) Input – Output Ratio

Input - Output Ratio = Gross Income/Total Cost.

(D) Benefit – Cost Ratio

Benefit – Cost Ratio = Net Income/ Total Cost.

Marketing concept**Marketable surplus**

Marketable surplus is the residual left with the farmer after meeting his requirement for family consumption, farm need for seed and feed for cattle.

MS= P-C

Where,

MS= Marketable surplus

P= Total production and

T= Total requirement

With the help of this ratio the management will be able to plane how much gross income required covering the cost and how the profitable is going to change with the production level. This can be used as a tool for future production, budget, pricing and profitability planning

Result and Discussion**Cost of cultivation of black rice**

The cost of cultivation is presented in table 4.8. It can be seen that on an overall per hectare cost of cultivation of paddy was estimated as Rs.51183 which varied from table.Rs.47998 per hectare at marginal farm to Rs.47998 per hectare at small farms, Rs. 51924 at medium farms and 52852 per hectare at large farms respectively. The major share of cost on the cultivation of paddy was observed as machinery charges (both bullock+ machinery) which was average estimated 27.02 percent. The next major cost was observed as human labour (Both hired + family) which was estimated about 25.75 percent which the contribution of family human labour and hired human labour was observed 6.57 percent and 19.21 percent respectively of the total cost of cultivation.

Table 1: Cost of cultivation of black rice (Rs/ha)

S. No	Particular	Marginal	Small	Medium	Large	Overall
1	Seed	2658 5.53%	2394 4.98%	2900 5.58%	2945 5.57%	2807 5.48%
2	Manure	3416 7.11%	2650 5.52%	3031 5.83%	3292 6.22%	3099 6.05%
3	Fertilizer	1278 2.66%	1190 2.27%	1080 2.07%	957 1.81%	1077 2.10%
	Irrigation charges	640 1.33%	542 1.12%	662 1.27%	620 1.17%	626 1.22%
4	Plant Protection Chemicals	4653 9.69%	4111 8.86%	5583 10.75%	5241 9.91%	5131 10.02%
5	Machinery Charges (Bullock + machinery)	12412 25.85%	13259 27.62%	13807 26.59%	14825 28.05%	13915 27.18%
6	Family Labour	3346 6.97%	3026 6.30%	3393 6.53%	3498 6.61%	3365 6.57%
7	Hired Labour	8593 17.90	9868 20.55	9962 19.18%	10055 19.02%	9832 19.21%
	Total Human Labour	11939 24.87%	12894 26.86%	13355 25.68%	13553 25.64%	13196 25.78%
9	Miscellaneous Charges	1000 2.08%	1000 2.08%	1100 2.11%	1000 1.89%	1039 2.03%
10	Interest on working capital	506 1.05%	507 1.05%	554 1.06%	566 1.05%	545 1.06%
A	Total variable cost	38502 80.21%	38547 80.30%	42172 81.21%	42998 81.3%	41476 81.02%
B	Fixed cost					
	Land Revenue	30 0.06%	30 0.06%	30 0.05%	30 0.05%	30 0.05%
	Rental Value Of	9050	8960	9250	9300	9199
	Owned Land	18.85%	18.66%	17.81%	17.59%	17.97%
	Depreciation Value	200 0.41%	210 0.43%	250 0.48%	300 0.56%	255 0.49%
	Interest on Fixed Capita	216 0.45%	214 0.44%	222 0.42%	224 0.42%	221 0.43%
	Total Fixed Cost	9496 19.78%	9414 19.61%	9752 18.78%	9854 18.64%	9705 18.95%
	Total cost (A + B)	47998 100%	47998 100%	51924 100%	52852 100%	50183 100%

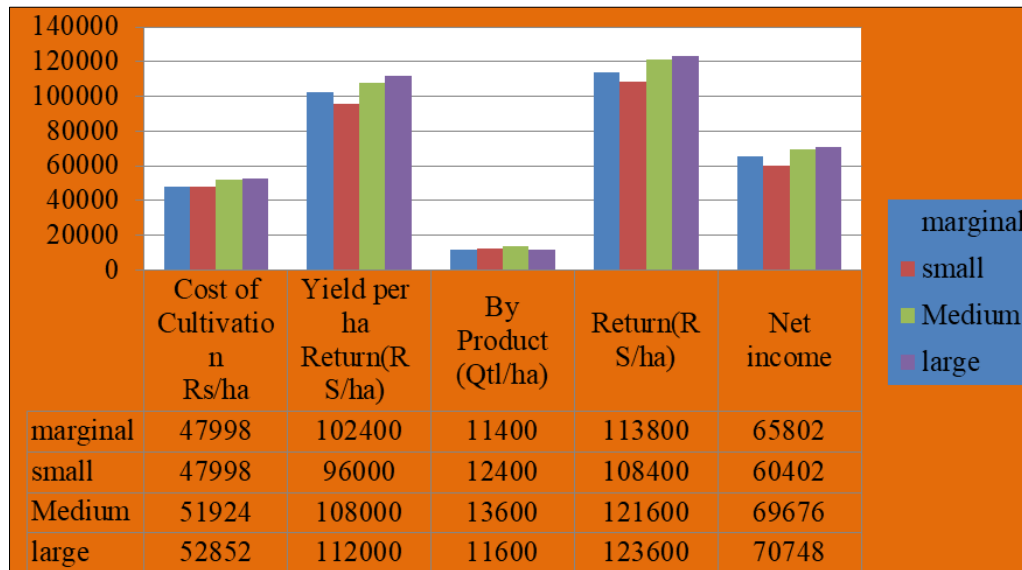
Profitability aspect of black rice cultivation

It was observed from table 4.10 that the overall cost of cultivation was Rs. 50183 (Table 4.10) of sample unit. The average production was 33 quintal per hectare and the average

by product production was 61 quintal per hectare. Return from by product was 12492. The average gross income per hectare was Rs. 119321 and the net profit was Rs. 68134 per hectare. The benefit cost ratio was 1:1.34.

Table 2: Profitability aspect of paddy cultivation (Rs/ha)

S. No.	Particular	Marginal	Small	Medium	Large	Overall
1	Cost of Cultivation Rs/ha	47998	47998	51924	52852	51183
2	Yield per ha Return (RS/ha)	32 102400	30 96000	34 108000	35 112000	33 106829
3	By Product (Qtl/ha) Return (RS/ha)	57 11400	62 12400	68 13600	58 11600	62 12492
4	Cost of production	1499	1599	1538	1510	1534
5	Gross Income (Rs /ha)	113800	108400	121600	123600	119321
6	Net income	65802	60402	69676	70748	68134
7	B:C ratio	1:1.37	1:1.25	1:1.34	1:1.33	1:1.34

**Fig 1:** Profitability aspect of paddy cultivation**Cost of Processing of Black Rice**

The average processing cost of black rice was estimated as Rs.112/Qtl. The major cost of processing was occurring in

gunny bag which was Rs.30 and second major cost was Rs.20 for labour. Milling cost was estimated as Rs.16 and Rs.10. For transportation cost of total processing cost.

Table 3: Cost of black rice processing (Rs/qtl)

S. No	Particular	Amount (Rs/Qty.)
1	Milling and processing	16 (14.28%)
2	Labour	20 (17.86%)
3	Oil, lubricant, repairing	3 (2.67%)
4	Gunny bags	30 (26.78%)
5	Storage	3 (2.67%)
6	Transportation	10 (8.92%)
7	Marketing/advertising	4 (3.57%)
8	Miscellaneous charge	3 (2.37%)
9	Interest on working capital	4 (3.57%)
	Total variable cost(A)	93 (83.04%)
1	Depreciation on building and equipment	15 (13.39%)
2	License fee	2 (1.78%)
3	Interest on fixed capital	1 (0.90%)
	Total fixed cost	19 (16.96%)
	Total cost (A+B)	112 (100%)

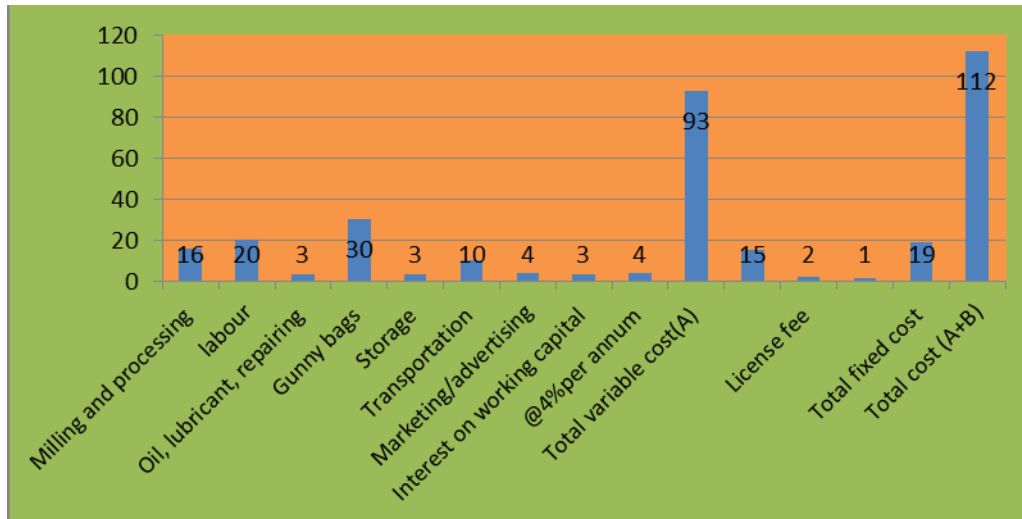


Fig 2: Processing cost of black rice

Profitability aspect of black rice processing

Table 4.12 showed that gross expense was Rs. 3312/Qtl in which major expense on raw paddy Rs. 3200/Qtl and

Rs.112/Qtl was processing cost. The average gross income was Rs. 5075/Qtl and net profit was Rs.1763Qtl.

Table 4: Profitability aspect of black rice processing (Rs/Qtl)

S. No.	Particular	Amount (Qty/Rs.)
i.	Value of main product Rice: bran (65:35)	4875
ii.	Value of by product	200
1	Gross income	5075
i.	Cost of unprocessed paddy	3200
ii.	Processing cost	112
2	Gross expense	3312
3	Net profit	1763
4	Input output ratio	1:1.87
5	B:C ratio	1:1.53

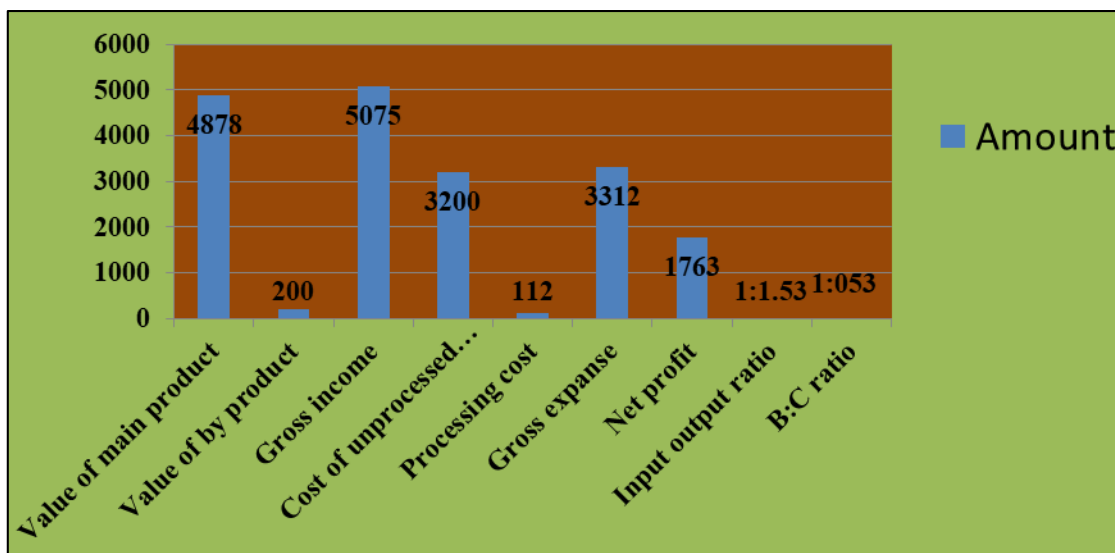


Fig 3: Profitability aspect of black rice processing

Marketed surplus of black rice in selected farms

The marketed surplus was more or less and this is arranged in the table 4.4. The farmer had growing black rice for the marketing purpose after the remaining quantities of black rice are used for the consumption and the seed purpose. It was

very interesting to note that the highest amount of marketable surplus was in marginal (85.96%), small farmer (78.79%), large farmer (67.81%) and medium farmer (60.40%) from total produce. The overall marketable surplus was observed 67.27%

Table 5: Marketed surplus of black rice in selected farm- size

Farm size	Total Production (Q.)	Food	Seed	Marketed surplus
Marginal	10.4	0.50	0.96	8.94
	100%	4.80%	9.23%	85.96%
Small	11.79	0.70	1.80	9.29
	100%	5.93%	15.26%	78.79%
Medium	19.65	1.5	6.28	11.87
	100%	7.63%	31.95%	60.40%
Large	55.90	3	14.99	37.91
	100%	5.36%	26.81%	67.81%
Overall	29.70	1.77	7.95	19.98
	100%	5.95%	26.76%	67.27%

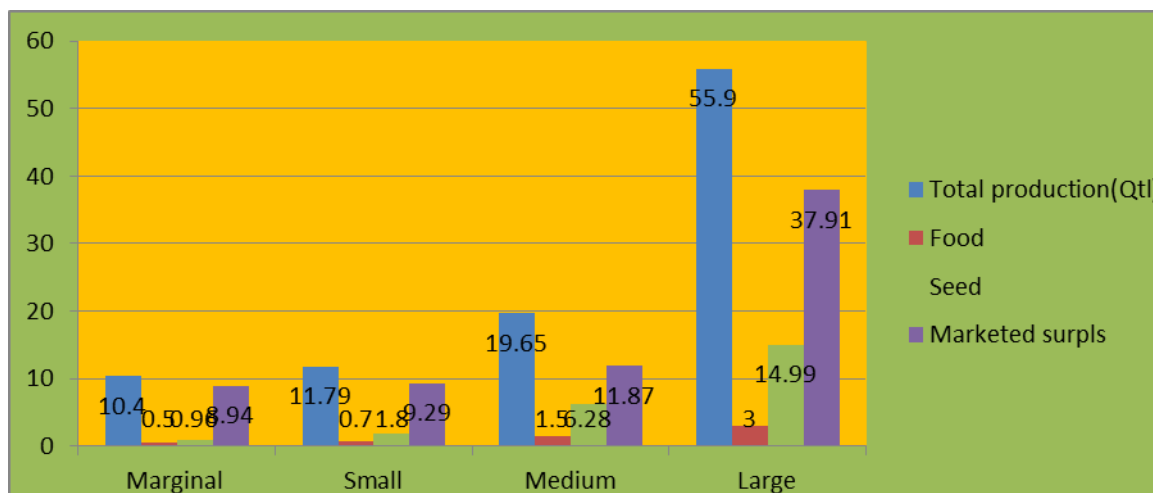


Fig 4: Marketable surplus of black rice

Disposal pattern

Farmer are registered under the farmer producer organization, they sold their produce through the different agencies. In the disposal pattern of black rice farmer producer organization

play a major role. The highest amount of black rice 30.69% sold through the FPO, 17.42%, 8.35%, 12.86%, 6.60% and 23.79% sold by the wholesaler, agent, processor, village trader, and consumer respectively.

Table 6: Disposal pattern of black rice (Qtl/Farm)

Particular	Marginal	Small	Medium	Large	overall
Total marketable surplus	8.94 100%	9.29 100%	11.87 100%	37.91 100%	19.98 100%
FPO	2.69 30.08%	3.25 34.98%	3.01 25.36%	12.2 32.18%	6.15 30.69%
Wholesaler	1.78 19.91%	0.84 9.04%	2.44 20.55%	6.45 17.02%	3.48 17.42%
Agent	0.51 5.70%	0.41 4.41%	0.83 7%	3.63 9.57%	1.70 8.35%
Processor	1.05 11.74%	0.54 5.81%	1.15 9.68%	5.66 14.93%	2.57 12.86%
Village trader	1.12 12.52%	1.38 14.85%	1.06 8.93%	1.81 4.77%	1.32 6.60%
Consumer	1.79 20.02%	2.87 30.89%	3.38 28.47%	8.16 21.52%	4.75 23.79%

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