Economics of paddy (Oryza sativa) production: A comparative study of Bihar and Punjab

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Abstract **- This study was carried out by interview and survey method in two different states of Bihar and Punjab. The cost of cultivation of rice in Punjab and Bihar is precisely produced from one party to the third included as of in a system management. As Rice is an essential element in structure of grain consumption, the data is collected by survey method by few opted members of the group and finally that method is re-evaluated and verified by the collectors of farmers in the selected village. The material methods are as followed such as the formulations required for the tally finally. And finally, the data is accordingly preferred to be rearranged by the tables and the difference is shown accordingly in the tables formulated. Where after calculating the result, outcome preferred to be the total fixed cost is more in Punjab than Bihar and many other factors varied equally. In the total working cost Punjab is high when compared to Bihar with a huge margin. Hence the cost of cultivation of wheat is more in Punjab than Bihar where it is implied as functional in many ways according to the references collected from various websites and books referred.**

INTRODUCTION

Rice, (Oryza sativa), edible starchy cereal grain and the grass plant (family Poaceae) by which it is produced. Roughly one-half of the world population, including virtually all of East and Southeast Asia, is wholly dependent upon rice as a staple food; 95 percent of the world's rice crop is eaten by humans. Rice is one of the most important food crops of India. Major share of rice is cultivated during Kharif season. A small share of rice is grown in rabbi /summer season with assured irrigation. Indian rice production largely depends on monsoon rains and only 59 per cent rice area has assured irrigation.

Rice cultivation in India extends from 8 to35ºN latitude and from sea level to as high as 3000 meters. Rice crop needs a hot and humid. Rice is the most important food crop of India covering about one-fourth of the total cropped area and providing food to half of the Indian population.

Plant description. Rice plant is an annual warm-season grass (monocot plant) with round culms, flat leaves and terminal panicles. Rice provides 21% of global human per capita energy and 15% of per capita protein. Although rice protein ranks high in nutritional quality among cereals, protein content is modest. Rice also provides minerals, vitamins, and fiber, although all constituents except carbohydrates are reduced by milling. The perceived characteristics of good-quality rice are uniformity of size and shape, whiteness, long and thin uncooked grains (i.e., long and slender), and round and fat cooked grains (i.e., bold cooked grains). Rice is unique because it can grow in wet environments that other crops cannot survive in. Such wet environments are abundant across Asia.

MATERIALS AND METHODS

The data was collected by the survey method. The primary the data was collected for a period of two weeks through interviews and survey with selected rice producers on a well-structured and pre-tested schedule. Data concerning marketing costs and margins were collected from Punjab and Bihar during the investigation. Several visits were made from time to time in order to collect the information.

The data collected has been verified by collectors from the village's farmers. Each precaution has been taken to ensure the accuracy and the reliability of the information. Information provided by respondents has been correctly edited by check and cross-check.

The study was based primarily on primary data, but secondary data was also used. Secondary data were obtained from the files of the following collectors from the fields.

ANALYTICAL TOOLS

The analysis tools contain both cost that is fixed and variable cost in determining the cost of cultivation of Paddy. The tools used are Average, gross returns, net returns and B: C ratio. Present lease value of land was use for land value cost.

Average – This is basic tool for the analysis of data. The formula used to calculate is given below.

$$\text{Average} = \frac{x1+x2+x3+x4+.....+xn}{n}$$

Depreciation cost- It was calculated to find the depreciated cost of an asset over time. Its functional form is given below

Depreciation value /year = (cost of asset- scrap value of asset)/Depreciation rate per year Where

Cost of asset is – initial cost of asset

Scrap value is – value of the asset after its useful life

Depreciation rate- Rate at which the asset is depreciates over the time

Gross returns – these are the returns before deducting any fee. Its functional form is given below

Gross returns = total yield × price

Net returns - These are the returns after deducting costs, *i.e.* gross returns minus Cost C. Its functional form is given below

Net returns = Gross returns – Cost of cultivation

Benefit cost ratio- It is an indicator use to analyse the whole value for money of a project and its functional form is given below

B: C = Net returns/ cost of cultivation

Interest on deposits - The amount of interest added by the end of a financial year is treated as income, which is then recorded as an account receivable on the business's balance sheet.

Interest = P*R*T/100

Where P is principal amount

R is rate of interest and

T is time period

Calculation: -

Cost of cultivation unit per hectare: -

Cost of cultivation =total cost /total area.

Farmer 1

Total area	10ha
Total cost	90343
Cost of cultivation	9,034.3 per hectare

Farmer 2

Total area	9 ha
Total cost	91711
Cost of cultivation	10,190.1 per hectare

Cost of cultivation unit per quintal: -

Cost of cultivation = total cost /total area.

Total area	10 ha
Total cost	91829
Cost of cultivation	9,182.9 per hectare

RESULT AND DISCUSSION

In this study, all the expenses and income related to cost of cultivation of Rice in Punjab and Bihar are shown in Tables 1 and 2.

Table1: The initial cultivation cost for growing wheat in Punjab and Bihar is listed in Table 1. Between these two States, the cost of Rice cultivation per hectare is revealed high in Punjab than Bihar respectively 88827.20 and 20687 according to Table 1. Average, the largest fixed cost share is estimated in Punjab with a value of the land rental cost owned (Rs 60,000) followed by depreciation on machinery (Rs 9,633.33), fixed interest (Rs 2,089.13). Punjab's total running average of Rs 71,722.27 is estimated to be the highest fixed cost while Bihar gets a lower average of Rs 56,484.33.

The average total working cost of Bihar Rs 20687.4 is estimated to be higher while Punjab procuring weighted average of Rs 16520.53. The largest average of all labours costs being higher in Bihar with an average expenditure of (Rs 5,036) in integrated labour including family, employees, and animals, followed by intercultural operation and comparatively Punjab is approximately around (Rs 4079.33), the cost of land preparation is higher in Punjab than Bihar respectively (Rs2026.67) and (Rs 0). Punjab made the biggest investment for cultivation of rice in the application of fertilizers especially phosphorus fertilizer in particular (Rs 4111.33) and nitrogen (Rs 1702.67), Bihar has the highest cost in fungicides and pesticides respectively (Rs646 .667) and (Rs 1330.667), with an average of (Rs 3056.67) for seeds of the Rice crop. Punjab has the lower interest rate on its operating cost of (Rs 505.20) just experienced than Bihar of (Rs 580.0667).

Table 2: It shows the average steady return for Punjab and Bihar. The average yield per hectare of the Rice crop was obtained at 52.80 quintals in Punjab, which is considered to be the lowest and Bihar has the highest at 59.8 quintals. Bihar is the state which abounds the

highest average price per quintal for Rice cultivation with (Rs 1840) while Punjab is with Rs 1835. Bihar has achieved the highest average gross and net yield of Rice harvest with Rs 110,032 per hectare and Punjab has the lowest with an estimated gross yield of Rs 96,888.82 per hectare. The overall benefit-cost ratio of these two sample states is 0.54, Bihar obtains 0.43 respectively, which is more advantageous on the cost of the dividend rate of Punjab 0.11. In addition, Bihar has shown itself to be the most beneficial state for the cultivation of Rice.

CONCLUSION

The cost of cultivation of rice in Punjab and Bihar is precisely produced from one party to the third included as of in a system management. As Rice is an essential element in structure of grain consumption, the data is collected by survey method by few opted members of the group and finally that method is re-evaluated and verified by the collectors of farmers in the selected village. The material methods are as followed such as the formulations required for the tally finally. And finally, the data is accordingly preferred to be rearranged by the tables and the difference is shown accordingly in the tables formulated. Where after calculating the result, outcome preferred to be the total fixed cost is more in Punjab than Bihar and many other factors varied equally. In the total working cost Punjab is high when compared to Bihar with a huge margin. Hence the cost of cultivation of Rice is more in Punjab than Bihar where it is implied as functional in many ways according to the references collected from various websites and books referred.

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Table 1. Fixed cost, Working and Cost of cultivation of rice in Punjab and Bihar.

A	Fixed Cost		
1	Rental value of owned land	60000	40100
2	Land revenue	0	0
3	Depreciation on machine per annum	9633.33	13240
4	Depreciation on building per annum	0	0
5	Insurance	0	1500
6	Interest on fixed cost	2089.13	1644.33
	Total Fixed Cost	71722.47	56484.33
B	Working Cost		
1	Labour		
a.	Family labour	870	970
b.	Hired labour	1046	1380
c.	Animal labour	0	0
2	Land preparation	2026.67	0
3	Seed	3056.67	2216.667
4	Manures	700	4580
5	Fertilizers		
a.	N	1702.67	803.3333
b.	P	4111.33	3946.667
c.	K	0	0
6	Plant protection		
a.	Seed treatment	0	0
b.	Fungicides	198	646.667
c.	Pesticides	1136.67	1330.667
7	Irrigation	920	1546.667
8	Intercultural operation	2163.33	2686.667
9	Interest on working cost per annum505.20	505.20	580.0667
	Total working Cost	16520.53	20687.4
	Cost of Cultivation	88827.20	20687

Table 2. Yield, Price/Quintal, Gross return and Benefit Cost Ratio

S.No	PARTICULAR	Weighted average (Rs/ha)	
		PUNJAB	Bihar
1	Yield	52.80	59.8
2	Price / quintal	1835.00	1840
3	Gross Return	96888.80	110032
4	Net Return	8060.80	32860.27
5	B.C Ratio	0.11	0.434203