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Economic analysis of paddy production and marketing in Puri, Odisha

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Abstract
The present study was conducted to analyse efficiency in marketing of paddy crop in Nimapara block, Puri district of Odisha. The study revealed that average revenue as well as B:C ratio were found to be the highest for large farm followed by marginal followed by small farms. The gross ratio was highest for small farms followed by large farms and marginal farms. But in case of operating ratio it is highest in case of marginal farm followed y large farm followed by small farm. There was sub-optimal use of labour, machine, fertilizer and pesticide as MVP of individual input is greater than the individual unit price. Inclusion of high yielding potential paddy seeds, adequate capital provision, assurance of proper of medical aids, adequate market news and market intelligence and timely crop insurance can lead to improvement in marketing efficiency in paddy crop in Odisha.

Keywords: benefit-cost analysis, efficiency, market analysis

Introduction
Rice is the basic staple food for about half of the world's population. International trade in rice is thin, with only about 5% to 7% of total world production being traded globally (Childs & Baldwin, 2010; Razzaque & Laurent, 2006; "Rice: Asia's Rice Bowls," 2011) [2, 5, 6]. In Asia, domestic policies basically ensure self-sufficiency in many countries. It is the second most important food crop of the world, cultivated in 118 counties on about 153.8 million ha with a production of about 618.5 million tons. The government of India has set a target of expanding the cultivation of hybrid rice to 25 % of the area occupied by the crop by 2017 (Spielman *et al* 2013) [7].

Agriculture is the mainstay of the state economy and the principal substance of the life of the people. Odisha is an agrarian state leading in rice production in the country and it used to supply a sizable amount of rice grain to the central pool of food stocks. Though its share in state gross domestic product (SGDP) has come down to less than 20 per cent, its total influence through forward and backward linkages with other sectors is much larger. Realizing this aspect, concerted efforts were initiated in 1960s to modernize the sector by adopting modern technology which marked the onset of green revolution in Indian agriculture (Dantwala, 1991) [3]. However, with the advent of modern technology and liberalization, there have been fluctuations in agricultural production rendering an intense debate on agricultural growth and instability in India since it has direct implications for food supply management and macroeconomic stability (Chand and Raju, 2009) [1]. The present study covers the economics of paddy production and marketing efficiency. It envisages suggesting possible corrective measure to bring about the desired improvement in production and marketing of paddy.

Methodology
The study was conducted by taking the primary data which was collected from 120 farmers of Nimapara block of Puri district by stratified random sampling method, out of which 12 large farmers, 72 medium farmers, 36 small farmers along with 38 farmers were taken from organized and unorganized sector

Cost Concepts

Cost groups	Items of the costs included
Cost A1	Seed, Manure, Fertilizer, Human labour, Hired labour, pesticides etc.
Cost A2	Cost A1 + rent paid for leased in land
Cost B1	CostA1 + interest on fixed capital
Cost B2	Cost B1+ rent paid on leased in land+ rental value of owned land
Cost C1	Cost B1+imputed value of family labour
Cost C2	Cost B2+ imputed value of family labour

Estimation of the cost ratios

1. **Gross Ratio:** The gross (cost) ratio of total expenses to gross income is a combined measure of the profit making ability of the farm, GR=TC/GI.
2. **Fixed Cost ratio:** The ratio of fixed cost per year and the gross income of the farm gives fixed cost ratio, FCR=TFC/GI.
3. **Return over variable capital:** This was calculated by deducting operational cost (TVC) from gross farm income, RVC=GI/TNC.

Resource use efficiency

The estimation coefficients from the stochastic regression model above were used to calculate the MVP and its ratio R with MFC used to determine the economics efficiency of resource used. The model was estimated as follows;

$$R = MVP/ MFC$$

Where,
R = efficiency ratio
MVP = Marginal Value Product of Variable Inputs
MFC = Marginal Factor Cost (price per unit inputs)

Based on economics theory, a farm maximizes profits with regards to resource use when the ratio of the marginal return to opportunity cost is one. The values are interpreted as follows;

- If r is <1; resource is excessively used or over utilize hence decreasing the quantity use of that resource increases profits.
- If r is > 1; resource is under use or is being underutilized hence increase in the rate of use will increase profit level.

If r is = 1; it show that the resource is efficiently used, that is optimum to utilization of resource hence the point of profit maximization (Olukosi and Ogunbile, 1989) [4].

Marketing efficiency

The price spread was applied to measure the degree of pricing efficiency. For farmers, it was calculated by deducting costs of marketing from gross price. For traders in all the channels, the price-spread focused on the trader's surplus as a percentage of total marketing costs.

Marketing efficiency is the ratio of the market output to market input. An increase in this ratio represents improved efficiency and decrease denotes reduced efficiency. It is the effectiveness or competence with which a market structure performs its designed function.

Marketing efficiency is represented as follows.

$$MEI= [V/ I]-1 \text{ (Shepherd's formula)}$$

Where,
MEI= Index of the marketing efficiency
V= Value goods sold/ retail price
I= Total marketing cost

MIE is the ratio of net price received by the farmer to the total marketing cost plus total margins follows;

$$MEI = FP/ (MC+ MM)$$

Where,
MEI= Marketing efficiency Index
FP = Farmer Price
MC= Marketing cost
MM = Marketing margin

Results

Total cost Revenue, benefit cost ratio of rice production

The total cost was seen to be higher for large farms (Table 1). The TC acres been partitioned into variable and fixed cost. TVC constituted 84.42 per cent of TC and TFC constituted 23.21 per cent of TC. The amount of fixed and variable cost increased with the farm size. The total cost on an average is ₹ 13086.37 of all farms for rice production. It is highest in case of large farm followed by small and followed by marginal farms. The table 1 reveals that per acre yield of rice was highest in case of large farms 20.58 quintal followed by small farms 16.45 quintals and marginal farms 14.12 quintal. The cost of production per quintal of rice was highest for large farms are ₹1152.72, ₹1124.12 and ₹1225.71 with on an average cost of production of all farms is ₹1085.10 respectively. On average total revenue is ₹42842.67 for all farms of rice in the study area. It is highest for large farm followed by marginal followed by small farms. Benefit cost ration on an average is 2.27 for all farm where as It is highest for large farm followed by marginal followed by small farms.

Table 1: Total cost, Revenue, benefit cost ratio of rice production (₹ per acre) in different categories of farm holdings

Particulars	Marginal farmers	Small farmers	Large farmers	All farms
Total variable cost(TVC)	9940.50 (82.12%)	10029.91 (76.45%)	13175.99(80.58%)	11048.80 (84.42%)
Total fixed cost (TFC)	2163.10 (17.87%)	3088.67 (23.54%)	3275.00 (20.02%)	3037.57 (23.21%)
Total costs (TVC+TFC)	12103.60 (100.00)	13118.58 (100.00)	16350.99 (100.00)	13086.37 (100.00)
Total Revenue(TR)	41354.00	27132.40	60041.6	42842.67
Benefit(TR-TC)	29250.4	14013.82	43690.61	29753.30
Benefit cost Ratio B:C Ratio	2.416	1.068	2.67	2.27

Farm size gross income

It was reported in Table 2 that the net income received by the three farm sizes per acre differed at 5 per cent level of significance. This means that large farmers who earned ₹ 60041.6 had more income compared to marginal and small farmers who earned ₹41354.00 and ₹27132.40 respectively. The good performance of large farmers in terms of quantities and yields of paddy was translated into more gross and net profits per acre compared to small and medium farmer.

Table 2: Gross income received by different categories of farmers

Categories of farmers	Gross income	Net income
Large farmers	60041.6	43690.61
marginal farmers	41354.00	14013.82
Small farmers	27132.40	29250.4
All farm	128582.13	115495.76

Farm efficiency measures in different farm sizes

These ratio measures like gross ratio, fixed ratio and operating

ratio were calculated to find farm efficiency measures. Farm efficiency is the ratio of total expenses to gross income. It is a combined measure of profit making ability of the farm which expresses the percentage of the gross income consumed by the expenses and is therefore, indicative of absolute size of business. It represents profit margin for business as a whole. Table 3 indicated that gross ratio was highest for small farms (0.48) followed by large farms and marginal farms (0.29) and (0.27) respectively. Fixed cost ratio was highest for small farms (0.235) followed by large farms and marginal farms i.e. (0.200) and (0.178) respectively. But in case of operating ratio it is highest in case of marginal farm followed y large farm followed by small farm i.e. (0.821), (0.805) and (0.764) respectively.

Table 3: Gross ratio, fixed ratio, and operating ratio of Rice in the sample holding of different categories of farms

Size Group	Gross ratio	Fixed cost ratio	Operating cost ratio
Marginal Farmers	0.29	0.178	0.821
Small Farmers	0.48	0.235	0.764
Large farmers	0.27	0.200	0.805
All farm	0.10	0.232	0.844

Resource use efficiency in different categories of farms

The resource use efficiency of variable input (X_i) was examined by $MVPx_i/Px_i$ ratio. The $MVPx_i/Px_i$ ratio indicates optimum use of resource. In order to find out optimum use of resource the difference of MVP and price ratio from unity was tested. A significant difference indicates sub-optimal allocation of resource. It was observed from the Table 4, that there was sub-optimal use of labor, machine, fertilizer and pesticide as MVP of individual input is greater than the individual unit price. But, there we found that manure is over untilled as MVP is less than the unit price of manure.

Table 4: Resource use efficiency in different categories of farms

Variable	Coefficients or elasticity	APP	MPP	Output Price (P_y)	MVP	Input Price (P_x)	Allocative Efficiency (MVP/P_x)
Ln labor (man day)	0.26908	3.04	11.32	1197	2718.9	250	10.87
Ln machine(hour)	0.518	1.17	2.27	1197	2569.81	2000	1.77
Ln manure(tractor load)	0.159	2.21	.352	1197	421.36	1000	1.02
Ln fertilizer(kg)	0.333	28.25	9.40	1197	11262.06	250	45.04
Ln pesticide (liter)	0.143		43.64	1197	9905.75	2670	3.57

Marginal value of product of variable of resource in sample farm

The resource use efficiency of variable input (X_i) was examined by $MVPx_i/Px_i$ ratio. The acquisition cost of resource was taken as rupee one. The $MVPx_i/Px_i$ ratio indicates optimum use of resource. In order to find out optimum use of resource the difference of MVP and price ratio from unity was tested.

Table 5: Marginal value of product of variable of resource in sample farm

Input statistics	Values
labour	
MVP	2718.9
Input price(MFC)	250
Difference	2468.9
S.E.	0.116
t-value	2.306
machine	
MVP	2569.81
Input price(MFC)	2000
Difference	569.81
S.E.	0.107
t-value	4.816
manure	
MVP	421.36
Input price(MFC)	1000
Difference	-573.64
S.E.	0.084
t-value	2.891
fertilizer	
MVP	11262.06
Input price(MFC)	250
Difference	11012.60
S.E.	0.137
t-value	2.436
pesticide	
MVP	9905.75
Input price(MFC)	2670
Difference	6235.75
S.E.	0.050
t-value	2.863

A significant difference indicates sub-optimal allocation of resource. It was observed from the Table 5, that there was sub-optimal use of labour, machine, fertilizer and pesticide as MVP of individual input is greater than the individual unit price. But, there we found that manure is over untilled as MVP is less than the unit price of manure.

Conclusion

The study concluded that the gross ratio was highest for small farms followed by large farms and marginal farms. Similar results were also found for Fixed cost ratio. But in case of operating ratio it is highest in case of marginal farm followed y large farm followed by small farm. There was sub-optimal use of labour, machine, fertilizer and pesticide as MVP of individual input is greater than the individual unit price. Labour, machine, fertilizer and pesticide are under utilization where as manure is over untilled in study area. Production and price of paddy acre has positive and significant correlation where as in case of rice consumption it has negative and significant relation with family size and age has non significant impact on marketed surplus. Inclusion of high yielding potential paddy seeds, adequate capital provision, assurance of proper of medical aids, adequate market news and market intelligence and timely crop insurance can lead to improvement in marketing efficiency in paddy crop in Odisha.

References

1. Chand R, Raju SS. Instability in Indian agriculture during different phases of technology and policy. Indian Journal of Agricultural Economics. 2009; 64(2):187-207.
2. Childs NW, Baldwin KL. Price spikes in global rice markets benefit U.S. growers, at least in the short term. Amber Waves. 2010; 8:32-37.
3. Dantwala ML. Strategy of agricultural development since independence. In: Indian Agricultural Development Since Independence: A Collection of Essays, Eds: M.L. Dantwala. Oxford & IBH Publishing, New Delhi, 1991, 1-15.
4. Olukosi JO, Ogunbile AO. Introduction to agricultural production economics: principles and applications. Zaria Nigeria: Agitab publishers limited, 1989.
5. Razzaque MA, Laurent E. Agriculture and rice trade liberalization: Potential implications for South Asian countries (Commonwealth Trade Hot Topics, Economic Affairs Division of the Commonwealth Secretariat, Issue No. 48). 1-8. Common wealth organization, 2006.
6. Rice: Asia's rice bowls—How serious will the impact of the Thai floods be on Asian tables. 2011; 12:73.
7. Spielman DJ, Koladi DE, Ward PS. The prospects for hybrid rice in India. Food Security. 2013; 5(5):651-65.