

An Economic Analysis of Production of Paddy (*Oryza sativa*) in Nalgonda District of Telangana

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Abstract:- The present study entitled “An economic analysis of production and marketing of paddy in nalgonda district of telangana” was conducted in the year 2019-2020. The study made use of a multistage sampling and random sampling technique to select 120 farmers among the selected villages. Data for the selected study were collected with the aid of well structured questionnaires. Data collected were analysed using tabular methods along with required statistical tools. The production of paddy has increased in the area largely due to productivity increase and increase in the area under crop, resource use structure in paddy was found to be varied among the size groups. The per cost of cultivation was varied among the size groups of paddy, highest in marginal (Rs. 57277.5/ha) and lowest in medium (Rs.54659/ha) and small (Rs.55703.4/ha). The input output ratio is highest on medium size farms and lowest on marginal size farms.

Keywords:- Paddy, Costs and Returns, Input Output Ratio, Productivity, Nalgonda.

I. INTRODUCTION

For the last several millennia, India has been known as a land of agriculture. Agriculture forms the backbone of Indian economy. Rice, a well known cereal, is the staple food of hundreds of millions of people in the world. Cultivated rice botanically called *ORYZA SATIVA* was first mentioned in history in 2800 B.C.

Rice is one of the chief grains of India. Moreover, this country has the biggest area under rice cultivation. It is in fact the dominant crop of the country. India is one of the leading producers of the crop. It demands a temperature of around 25 degree Celsius and above and rainfall of more than 100cm. Rice is the staple food of eastern and southern parts of India. In 2017-2018, production of rice is estimated at a new record of 112.9 million tonnes. Rice production is 6.25 million tonnes higher than the previous record production of 106.65 million tonnes achieved during 2013-2014 and has increased significantly by 8.49 million tonnes than the production of 104.41 million tonnes during 2015-16. Rice commands recognition, as a supreme commodity to mankind, because rice is truly life, culture, a tradition and a means of livelihood to millions. It is an important staple food providing 66-70%

body calorie intake to the consumers. Nutrient value of rice contains the highest amount of carbohydrate, about 65-70%, 7-8% protein, 2-3% fat and a rich source of minerals and vitamins like phosphorous, manganese, iron, folic acid, thiamine and niacin.

II. RESEARCH METHODOLOGY

The study was conducted in Nalgonda district of Telangana which is one of the 31 districts of Telangana. Nalgonda district comprising 31 blocks among 2 blocks was selected i.e., Thripuram and Miryalguda blocks were selected for the study. A list of 6 villages were selected randomly out of them. A list of all paddy farmers/respondents is prepared with the help of head of the villages pradhan or head of each selected villages in the both block, there after farmers/respondents is categorized into categories on the basis of their land holding and then from each village 10% farmers were selected randomly from all the different size of farm groups.

Data for the study was collected from all 120 farmers randomly i.e., 52 marginal farmers, 48 small farmers, 20 medium farmers. Tabulation method is used for analysis of data along with required statistical tools for the interpretation of the results.

III. RESULTS AND DISCUSSIONS

The study was conducted in Nalgonda district of Telangana. The necessary data were collected from the sample farmers over 2 blocks in the mentioned district. The present chapter is going to talk about the results and discussion for various objectives. The chapter is arranged in different sub-section according to objectives of the study.

- To study cost and return per hectare and input output ratio of different size of farm groups.

➤ Cost concepts

1. Cost- A_1 : It includes the value of:

- Imputed value of machine charges (hired and owned)
- Bullock charges (hired and owned)
- Cost of Seedlings
- Cost of Manures and fertilizers
- Cost of Plant protection chemical

- Cost of Irrigation charges
 - Miscellaneous charges
 - Interest on working capital
 - Depreciation on fixed resources
 - Land revenue paid to government
 - The total of all these cost items make up Cost A₁.
2. Cost A₂ = Cost A₁+ Rent paid for leased-in land, if any.
 3. Cost B = Cost A₂ + Imputed rental value of owned land + interest on owned fixed capital
 4. Cost C = Cost B + Imputed value of family labour.
- Cost C is the total cost of cultivation or gross cost.

➤ *Measures of Farm Profitability:*

1. **Gross income** = per quintal price* yield per hectare in quintal

2. **Farm business income** = Gross income – Cost A₂
3. **Net income** = Gross income – Cost C
4. **Farm investment income** = net income + rental value of owned land + interest on fixed capital
5. **Input Output Ratio** =Cost C-Gross income
6. **Family Labour Income** = Gross Income – Cost B

➤ *Resource use and Cost of cultivation of Paddy per hectare in different size of farm groups:*

The economic aspects of Paddy such as cost of cultivation, returns per hectare, input and output ratio of marginal size, small and medium size farm groups are given below

Table 1: Resource use and Cost of cultivation of Paddy per hectare in different size of farm groups

S. NO	PARTICULARS	MARGINAL	SMALL	MEDIUM	SAMPLE AVERAGE
1	Hired Labour	5500 (9.6)	5750 (10.3)	6000 (10.9)	5750 (10.2)
2	Machinery Cost	11000 (19.2)	10000 (17.90)	9050 (16.50)	10016.67 (17.95)
3	Cost of Seed	2050 (3.57)	1980 (3.55)	1950 (3.56)	1993.30 (3.56)
4	Cost of Manure	2500 (4.36)	2400 (4.3)	2350(4.29)	2416.6 (4.32)
5	Cost of fertilizer	5500 (9.6)	5200 (9.33)	5150 (9.42)	5283 (9.45)
6	Cost of Plant Protection Chemicals	10300 (17.90)	10150 (18.22)	10000 (18.29)	10150 (18.16)
7	Cost of Irrigation	1000 (1.74)	1000 (1.79)	1100 (2.01)	1033.3 (1.84)
8	Interest on working Capital @ 8%	3028 (5.28)	2918.4 (5.23)	2848 (5.21)	2931.4 (5.24)
9	Depreciation	450 (0.78)	500 (0.89)	550 (1)	500 (0.89)
10	Land Revenue Paid to Govt.,	0	0	0	0
11	Rental Value	10000 (17.4)	10000 (17.90)	10000 (18.20)	10000(17.80)
12	Interest on Fixed Capital @ 11%	1149.5 (2)	1155 (2.07)	1160.5 (2.12)	1155 (2.06)
13	Family Labour	4800 (8.3)	4650 (8.34)	4500 (8.23)	4650 (8.32)
14	Total Cost of Cultivation	57277.5 (100)	55703.4(100)	54659 (100)	55880 (100)

(figures in parenthesis are the percentage)

In the above table no.1 explains about the total cost of cultivation of paddy with different farm sizes and cost incurred upto production. The Marginal size respondent is using 2050 rupees investment on seed and its consist of 3.57 percentage of total cost of cultivation and 5500 rupees investment on hired labour charges and its consists of 9.60 percentage of total cost of cultivation and 11000 rupees invested on machinery and its consist of 19.2 percentage of total cost of cultivation and 2500 rupees invested on manures and its consist of 4.36 percentage of total cost of cultivation and 10300 rupees invested on plant protection chemicals and its consist of 17.9 percent in total cost of cultivation and 5500 rupees invested on fertilizers and its consist of 9.60 percent in total cost of cultivation and 3028 rupees invested on working capital interest and its consist of 5.28 percentage of total cost of cultivation and govt. not taking land revenue from farmers and 450 rupees invested on depreciation of fixed capital and

its consist of 0.78 percent in total cost of cultivation and 10000 rupees invested on rental value of land and its consist of 17.4 percentage of total cost of cultivation and 1149.5 rupees invested on fixed capital interest and its consist of 2.00 percentage of total cost of cultivation and 4800 rupees invested on family labour and its consist of 8.3 percent in total cost of cultivation and total expenditure of marginal farm respondent is57277.5.

The Small size respondent is per hectare cultivation using 1980 rupees investment on seed and its consist of 3.55 percentage of total cost of cultivation and 5750 rupees investment on hired labour charges and its consists of 10.3 percentage of total cost of cultivation and 10000 rupees invested on machinery and its consist of 17.9 percentage of total cost of cultivation and 2400 rupees invested on manures and its consist of 4.30 percentage of total cost of cultivation

and 10150 rupees invested on plant protection chemicals and its consist of 18.22 percent in total cost of cultivation and 5200 rupees invested on fertilizers and its consist of 9.33 percent in total cost of cultivation and 1000 rupees invested on irrigation and its consist of 1.79 percentage of total cost of cultivation and 2918.4 rupees invested on working capital interest and its consist of 5.23 percentage of total cost of cultivation and govt. not taking land revenue from farmers and 500 rupees invested on depreciation of fixed capital and its consist of 0.89 percent in total cost of cultivation and 10000 rupees invested on rental value of land and its consist of 17.9 percentage of total cost of cultivation and 1155 rupees invested on fixed capital interest and its consist of 2.07 percentage of total cost of cultivation and 4650 rupees invested on family labour and its consist of 8.34 percent in total cost of cultivation and total expenditure of small farm respondent is 55703.4.

The Medium size respondent is per hectare cultivation using 1950 rupees investment on seed and its consist of 3.56 percentage of total cost of cultivation and 6000 rupees

investment on hired labour charges and its consists of 10.9 percentage of total cost of cultivation and 9050 rupees invested on machinery and its consist of 16.5 percentage of total cost of cultivation 2350 rupees invested on manures and its consist of 4.29 percentage of total cost of cultivation and 5150 rupees invested on fertilizer and its consist of 9.42 percent in total cost of cultivation and 10000 rupees invested on plant protection and its consist of 18.29 percent in total cost of cultivation and 1100 rupees invested on irrigation and it consist of 2.01 percentage in total cost of cultivation and 2848 rupees invested on working capital interest and its consist of 5.21 percentage of total cost of cultivation and govt. not taking land revenue from farmers and 550 rupees invested on depreciation of fixed capital and its consist of 1.00 percent in total cost of cultivation and 10000 rupees invested on rental value of land and its consist of 18.2 percentage of total cost of cultivation and 1160.5 rupees invested on fixed capital interest and its consist of 2.12 percentage of total cost of cultivation and 4500 rupees invested on family labour and its consist of 8.23 percent in total cost of cultivation and total expenditure of medium farm respondent is 54658.5.

ANOVA:

Source	DOF	SS	MSS	Fcal	F tab 5%	Results	S.ED(±)	C.D 5%
Size of Groups	2	4177004	2088502	0.962879	3.402826	NS	1202.503	2434.339
Particulars	12	630703144.11	52558595	24.23151	2.18338	S	577.6635	1169.419
Error	24	52056446	2169019	--	--	--	--	--
Total	38	--	--	--	--	--	--	--

In the above anova table, due to size group degree of freedom is 2, sum of squares is 4177004, mean sum of squares is 2088502, F.calculated value is 0.962879, F.tabulated value @5% is 3.4028. In due to particulars, degrees of freedom is 12, sum of squares is 630703144.11, mean sum of squares is 52558595, F.calculated value is 24.23151, F. tabulated value is 2.18, result is significant, standard deviation is 577.6635 and critical difference @5% is 1169.419. In error, degrees of

freedom is 24, sum of squares is 52056446 and mean sum of squares is 2169019.

➤ *Cost concepts in paddy per hectare in different size of farm groups:*

Below table explains the cost of cultivation in paddy crop per hectare in different size of farm groups with cost A1 and cost A2 and cost B and cost C.

Table no.2 : Cost concepts in Paddy per hectare in different size of farm groups:

S. No	Cost concepts	MARGINAL	SMALL	MEDIUM	Sample Average
1	Cost A1	41328	39898.4	38998	40074.8
2	Cost A2	51328	49898.4	48998	50074.8
3	Cost B	52478	51053.4	50159	51129.8
4	Cost C	57278	55703.4	54659	55879.8

In the above table no,2 explains about return and output of marginal size respondents, cost A1 is 41328 and cost A2 is 51328 and cost B is 52477.5 and cost C is 57277.5. Small size respondents cost A1 is 39898.4 and cost A2 is 49898.4 and cost B is 51053.4 and cost C is 55703.4. Medium size respondents cost A1 is 38998 and cost A2 is 48998 and cost B

is 50158.5 and cost C is 54658.5. Average sample respondents cost A1 is 40074.8 and cost A2 isn50074.8 and cost B is 51129.8 and cost C is 55879.8.

➤ *Output and returns in paddy crop per hectare in different size of farm groups:*

Below table explains about cost of cultivation per quintal, yield per quintal and cost of production per quintal, price of product, gross return, net return and benefit cost ratio.

Table no.3: Output and returns in Paddy crop per hectare in different size of farm groups:

S. No	Particulars	Size of farm groups			Sample Average
		MARGINAL	SMALL	MEDIUM	
1	Cost of cultivation(Rs./ha)	57,277.50	55,703.40	54,658.50	55,879.80
2	Yields/ quintal	65.00	68.00	70.00	67.60
3	Price of product	1,835.00	1,835.00	1,835.00	1,835.00
4	Cost of production	880.40	819.16	780.80	826.60
5	Gross return	119,275.00	124,780.00	128,450.00	124,046.00
6	Net return	62,047.50	69,076.60	73,791.50	68,166.20
7	Cost benefit ratio	1:2.08	1:2.24	1:2.35	1:2.21

Table no.3 explains about marginal size respondents cost of cultivation per hectare is 57277.5, yield is 65 quintals per hectare, gross hectare is 119275 and net return in marginal size respondents is 62047.5 and price spread of product is 1835 and cost of production per quintal is 880.4 and cost benefit ratio is 1:2.08.

Small size respondents cost of cultivation per hectare is 55703.4, yield is 68 quintals per hectare, gross return is 124780 and return in small size respondents is 69076.6 and cost of production per quintal is 819.16 and cost benefit ratio is 1:2.24.

Medium size respondents cost of cultivation per quintal is 54658.5, yield is 70 quintals per hectare, gross returns is 128450 and net return in medium size respondents is 73791.5 and cost of production per quintal is 780.8 and cost benefit ratio is 1:2.35.

Average sample of marginal, small and medium size respondents are cost of cultivation per quintal 55879.8, yield is 67.6 quintals per hectare, gross return is 124046 and net return is 68166.2 and cost of cultivation per quintal is 826.6 and cost benefit ratio is 1:2.21.

ANOVA:

Source	DOF	SS	MSS	Fcal	F tab 5%	Results	S.ED(±)	C.D 5%
Size of Groups	2	1518.123	759.0615	0.857243	6.944272	NS	24.29634	56.02746
Particulars	2	4716224	2358112	2663.125	6.944272	S	17.18011	39.6174
Error	4	3541.873	885.468	--	--	--	--	--
Total	8	--	--	--	--	--	--	--

In the above table, in due to size group degrees of freedom is 2, sum of squares is 1518.123, mean sum of squares is 759.0615, F.calculated value is 0.857243, F.tabulated value is 6.944272, result is non-significant, standard deviation is 24.29634 and critical difference@5% is 56.02746. In due to particulars, degrees of freedom is 2, sum of squares 4716224, mean sum of squares is 2358112,

F.calculated value is 2663.125, F.tabulated value is 6.944272, result is significant, standard deviation is 17.18011 and critical difference @5% is 39.6174. In error, degrees of freedom is 4, sum of squares is 3541.873 and mean sum of squares is 885.4682.

➤ *Measures of farm income:*

Table no.4 Measures of farm income in rice production (Rs.ha⁻¹)

S.NO	PARTICULARS	MARGINAL	SMALL	MEDIUM	SAMPLE AVERAGE
1	Gross income	119275	124780	128450	124168.3
2	Net income	62047.5	69076.6	73791.5	68305.2
3	Farm business income	67947	74881.6	79452	74093.5
4	Farm labour income	73197	80231.6	84952	79460.2
5	Farm investment income	61997.5	69076.6	73791.5	68288.5

An important aspect of farm business management and decision making relates to the manner in which the available

resources are allocated. A measuring rod is necessary to evaluate the quintal use of resources. To achieve this

objective, various farm efficiency measure viz., gross income, net income, farm business income, family labour income, farm investment income.

Gross income exhibited a direct relationship with the farm size and it was of the order of Rs.119275, Rs.124780, Rs.128450 and Rs.124168.3 on marginal, small, medium and average respectively. The gross income was more on marginal farmers due to highest productivity compared to other categories of farmers. Though the gross income is a measure to assess the efficiency of the farm business, it alone does not help us to gauge the success of the farm business. Therefore, another measure namely net income, which represents a surplus of gross income over total costs was estimated. The net income showed a direct relationship with the farm size. Medium farmers recorded a net income of Rs.73791.5 against Rs.62047.5 and Rs.69076.6 on marginal and small farmers respectively. The same was on sample average Rs.68305.2.

Farm business income, which indicates returns on owned resources like land, labour and capital, was also more among medium farmers Rs.79452 as compared to marginal farmers Rs.67947 and small farmers Rs.74881.6 which means the medium farmers were superior to small and marginal farmers in effective usage of these resources.

Farm labour income is another measure of farm efficiency representing the returns from farmers own labour and family labour income amounting to Rs.84952, while it was Rs.80231.6 and Rs.73197 in small and marginal farmers respectively. The same on sample average farm was Rs.79460.2.

Farm investment income as a measure of returns to fixed capital was Rs.61997.5, Rs.69076.6, Rs. 84952 and Rs.79460.2 in marginal, small, medium and sample average respectively. Thus, all farm income measures were increasing with farm size.

ANOVA:

Source	DOF	SS	MSS	Fcal	F tab 5%	Results	S.ED(±)	C.D 5%
Size of Groups	2	317472885.8	158736443	486.6486	4.45897	S	466.321	1000.159
Particulars	4	6656873324	1664218331	5102.102	3.837853	S	3612107	774.7198
Error	8	2609463	326182.9	--	--	--	--	--
Total	14	--	--	--	--	--	--	--

In anova table, due to size group degrees of freedom is 2, sum of squares is 317472885.8, mean sum of squares is 158736443, F.calculated value is 486.6486, F.tabulatedvalue@5% 4.45896, result is significant, standard deviation is 466.321 and critical difference@5% is 1000.159. In due to particulars, degrees of freedom is 4, sum of squares is 6656873324, mean sum of squares is 1664218331, F.calculated value is 5102.102, F.tabulated value is 3.837853, result is significant, standard deviation is 3612107 and critical difference@5% is 774.7198. In errors, degrees of freedom is 8, sum of squares is 2609463 and mean sum of squares is 326182.9.

IV. CONCLUSION

The production of paddy has increased largely due to productivity increase and increase in the area under the crop. The acreages under paddy were not influenced by improvement in productivity but it largely depended on the other factors like rainfall and price of this crop. Resource use structure in paddy was found to be varied among the size groups. Production cost of paddy was the highest on marginal size farms and lowest on medium size farms. Among which rental value of land, hired labour, fertilizers, manures, seeds were the major items of cost. The cost of cultivation varied among the size groups of paddy growers.

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