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An economic analysis of production of paddy (*Oryza sativa*) in Mahabubnagar district of Telangana

Cheruku Saipriya and Mukesh K Maurya

Abstract
The research entitled "An economic analysis of production and marketing of paddy (*Oryza sativa*) in Mahabubnagar district of Telangana" with a sample size of 120 respondents who was chosen through stratified sampling. The farmers were categorized as marginal, small and medium, large size group of the basis of the size of the farms each farmer had. Survey was conducted by personal interview method with use of pre - structured schedule questionnaire. After the analysis of the data, it was found that paddy cultivation was profitable at all categories of farm. The total costs of cultivation & gross income per hectare was positively related with size of farms and was negatively related to trend of net income. By the study it can be concluded that according to the farm size of the farmers resources were not efficiently used in Paddy cultivation. Technical, managerial & financial problem were also noticed as major constraints.

Keywords: analysis of production of paddy (*Oryza sativa*) in mahabubnagar district of telangana, and marketing of paddy

Introduction
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 this crop. Rice is the basic food crop and being a tropical plant, it flourishes comfortably in hot and humid climates. Rice is mainly grown in rain fed areas that receive heavy annual rainfall. That is why it is fundamentally a *kharif* crop in India. It demands a temperature of around 25 degrees Celsius and above and rainfall of more than 100 cm. Rice is also grown through irrigation in those areas that receive comparatively less rainfall. Rice is the staple food of eastern and southern parts of India. In 2017-18, production of rice is estimated at a new record of 112.9 million tons. Rice production is 6.25 million tons higher than the previous record production of 106.65 million tons achieved during 2013-2014 and has increased significantly by 8.49 million tons than the production of 104.41 million tons during 2015-16. Rice commends 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 phosphorus, manganese, iron, folic acid, thiamine and niacin. The United Nations General Assembly, in a resolution declared the year of 2004 as the "International Year of Rice", which has tremendous significance to food security. It very eloquently upheld the need to heighten awareness for the role of rice in alleviating poverty and malnutrition (Barah and Pandey, 2005). "An economic analysis of production and marketing of paddy (*Oryza sativa*) in Mahabubnagar district of Telangana" was conducted with following specific objectives:

Material and Method
The research was conducted in Mahbubnagar district of Telangana a total sample size was 120 respondents. Purposive and stratified sampling was used opted as a sampling method. Pre-structured and pre-tested close ended questionnaire was used to collect data from the respondents manually. The data collected was analyzed with the help of Microsoft excel by finding out the frequency, percentage and arithmetic mean that was worked out for the purpose of comparison among different size of holdings.

Analytical tools
The data collected from the sample farmers were analyzed and estimated with certain

statistical techniques.

Descriptive statistics
Frequency, percentage and arithmetic mean were worked out for the purpose of comparison among different size of holdings.

$$A = \frac{(x_1 + x_2 + x_3 + \cdots + x_n)}{n}$$

Where, A = Arithmetic mean
$x_1 + x_2 + x_3 + \cdots + x_n$ are the value of individual items
n = number of individuals

Average
The simplest and important measures of average which have been used into statistical an analysis was the weighted average. The formula used to estimate the average is:

$$Weighted\ average = \frac{\Sigma\, W_i X_i}{\Sigma W_i}$$

Where,
W.A. = Weighted average
X_i = Variable
W_i = Weights of Xi

Cost concepts
The cost concepts and the items of cost included under this study are given below:

Cost A1
This cost approximates and actual expenditure incurred in cash and kind. Values of hired/owned human, bullocks and machineries & implements laborers. Value of seed (both farm produced and Family labour income:
Value of manure (Owned and purchased)
Value of insecticides and pesticides and chemical fertilizers
Depreciation on implements and farm buildings
Irrigation charges
Land revenue, assets and other taxes
Interest on working capital
Miscellaneous expenses (Artisans, etc.)
Cost A2: Cost A1 + Rent paid for leased in land
Cost B2: Cost A2 + Interest on value of owned fixed capital assets (Excluding land)
Cost B2: Cost B1 + Rental value of owned land Cost of concentrates (Net land revenue) and rent paid for leased in land.
Cost C1: Cost B1 + Imputed value of family labour
Cost C: Cost B2 + Imputed value of family labour
Cost C3: Cost C2 + 10% of C (Managerial cost).

Income concepts
Gross income: Value of farm output (main product and by product) whether sold or utilized by the farm family.
Net income: It is the different between gross income and total cost i.e. gross income e minus cost C1 or cost C2 or cost C3.
Family labour income: Gross income minus cost B2.
Farm business income: Gross income minus cost A1 or cost A2 in case of land, leased in farm.
Farm investment income: Net income over cost C2 plus rental value of owned land plus interest on owned fixed capital.
Imputation procedures: Some of the inputs used in the production process come from family sources. The procedures adopted for deriving imputed values are as given under:
Family labour: On the basis of wages paid to attached from servant.
Owned animal labour: On the basis of maintenance which includes the following:
Cost of green and dry fodder
Cost of concentrates
Depreciation on animals and cattle sheds.
Labour charges
Other expenses, if any

Result and Discussion

Table 1: Socio demographic profiles of the respondents

(a) Age of the respondents

S. No.	Age of respondents	Type of farmer				Sample average
		Marginal	Small	Medium	Large	
1.	Less than 35	5 (4.17)	9 (7.50)	11 (9.17)	8 (6.67)	33 (27.50)
2.	35-50	17 (14.17)	39 (32.50)	14 (11.67)	5 (4.17)	75 (62.50)
3.	More than 50	2 (1.67)	5 (4.17)	2 (1.67)	3 (2.50)	12 (10.00)
	Total	24 (20.00)	53 (44.17)	27 (22.50)	16 (13.33)	120 (100.00)

b) Educational level of sample farmers

S. No.	Education	Type of farmer				Sample average
		Marginal	Small	Medium	Large	
1.	Illiterate	17 (14.17)	11 (9.17)	9 (7.50)	7 (5.83)	44 (36.67)
2.	Primary school	2 (1.67)	8 (6.67)	5 (4.17)	4 (3.33)	19 (15.83)
3.	Middle school	1 (0.83)	23 (19.17)	4 (3.33)	2 (1.67)	30 (25.00)
4.	Intermediate	2 (1.67)	7 (5.83)	3 (2.50)	1 (0.83)	13 (10.83)
5.	Under graduation	1 (0.83)	3 (2.50)	6 (5.00)	1 (0.83)	11 (9.17)
6.	Post-graduation	1 (0.83)	1 (0.83)	0 (0)	1 (0.83)	3 (2.50)
	Total	24 (20.00)	53 (44.17)	27 (22.50)	16 (13.33)	120 (100.00)

c) Family size of the farmers

S. No.	Family size of respondents	Type of farmer				Sample average
		Marginal	Small	Medium	Large	
1.	Less than 5 members	8 (6.67)	4 (3.33)	11 (9.17)	9 (7.50)	32 (26.67)
2.	5 and more than 5 members	16 (13.33)	49 (40.83)	16 (13.33)	7 (5.83)	88 (73.33)
	Total	24 (20.00)	53 (44.17)	27 (22.50)	16 (13.33)	120 (100.00)

d) Average land holdings

S. No.	Average land holding of respondents	Type of farmer				Sample average
		Marginal	Small	Medium	Large	
1.	Sample respondents	24	53	27	16	120
2.	Average land holding	0.46	2.58	6.58	12.50	5.53

Table No. 1 depicts the socio demographic profile of the respondents. The age of an individual has a great influence on his/her ability to take part in economic activities and of course chances of benefiting from the ongoing enterprise. Age-wise distribution of farmers in the study area is shown in table 1. It is evident from the table that on overall basis, 62.50 percent of paddy growing farmers were in the middle age group (35-50 years). Only 10 percent farmers were in the old age group (>50 years) and 27 percent farmers were in the young age group (<35 years). It can be inferred that most of the paddy growing farmers in the study area were mature and they were in middle age group, who generally possesses risk taking attitude. Educational profile of the farmers decides the relative exposure of the farmer to latest technologies. Farmers need a basic level of education to understand and read relevant news, rules and notices which can affect productivity significantly. It equips the individual with the skill to read write record receive training and seek information. The educational qualifications of farmers of study area are given in table b., 36.6% of farmers are illiterate, 15.83% had primary school education, 25% have middle school education 10.83% intermediate, 9.17% farmers had under-graduation, 2.50% farmers have done their post-graduation. The details of land holding area under different size group of sample farms are given in table d of cultivated land owned by different size group of sample farms revealed.

Table 2: Per hectare costs and income measures from paddy production on various costs concept (Rs.)

S. No.	Cost concepts	Type of farmer				Sample average
		Marginal	Small	Medium	Large	
1.	Cost A1	36081.31	45699.90	62235.10	89279.80	58324
2.	Cost A2	46081.31	55699.90	72235.10	99279.80	68324
3.	Cost B	47231.31	56854.9	73395.1	100445	69481.60
4.	Cost C	52181.30	62105	78745	105995	74756.60

S. No.	Measures of farm income	Type of farmer				Sample average
		Marginal	Small	Medium	Large	
1.	Gross income	43650	44700	45120	45300	44685
2.	Net income	8531.3	16984.90	34045.10	60695	30071.54
3.	Farm business income	2431.31	10579.9	27535.1	53979.8	23639
4.	Farm labour income	8531.3	16985	34045	60695	30071.6
5.	Farm investment income	19493.9	44549.8	95625.8	175370	83782.1

S. No.	Output and returns	Type of farmer				Sample average
		Marginal	Small	Medium	Large	
1.	Cost of cultivation (Rs./ha)	52181.30	62104.90	78745.10	105995	74756.54
2.	Yields/quintal	29.10	30.08	29.80	30.20	29.79
3.	Price of product	1835	1835	1835	1835	1835
4.	Cost of production	1793.17	2064.76	2642.45	3509.77	2509.45
5.	Gross return	43650	44700	45120	45300	44685
6.	Net return	8531.3	16984.90	34045.10	60695	30071.54
7.	Benefit cost ratio	1:1.19	1:1.37	1:1.76	1:2.33	1:1.67

Table no. 2 revealed that, on an average cost A1/A2, cost B, cost C came to Rs. 58324, Rs. 68324, Rs. 69481.60 and Rs. 74756 respectively. On an average, gross income was recorded Rs. 44685 and net income came to Rs. 30071.54. On Large farms, gross income was highest, which was recorded Rs. 45300.00, followed by medium farms Rs. 45120 and lowest on marginal farms i.e. Rs. 43650 respectively. The net income was highest on large farms Rs. 60695, followed by medium farms Rs. 34045.10 and small farms Rs. 16984.90 and lowest marginal farms. On an average family labour income, farm business income and farm investment income were observed to 30071.6, Rs. 23639 and Rs. 83782 respectively. Farm labour income was highest on large farms followed by medium, small and marginal farms & farm investment income was highest on marginal farms followed by small farm and medium farms and farm business income was highest on marginal farms, followed by small farms and medium farms. On an average, cost of production per quintal and yield per hectare were estimated to Rs. 2509.45 and 29.79/q respectively.

Table 3: Constraints/Problem of paddy cultivation on different size of sample farms.

S. No.	Constraints	Type of farmer				Rank
		Marginal	Small	Medium	Large	
1.	High cost of seed	1 (0.83)	6 (5.00)	2 (1.67)	1 (0.83)	VI
2.	High wages for labour	3 (2.50)	6 (5.00)	3 (2.50)	1 (0.83)	IV
3.	Non-availability of labour during peak period	5 (4.17)	9 (7.50)	6 (5.00)	3 (2.50)	II
4.	High cost of manures and fertilizers	4 (3.33)	7 (5.83)	4 (3.33)	4 (3.33)	III
5.	Incidence of pest and disease attack	2 (1.67)	5 (4.17)	3 (2.50)	2 (1.67)	V
6.	High cost of plant protection chemicals	7 (5.83)	15 (12.50)	7 (5.83)	5 (4.17)	I
7.	Non-availability of loan in time	2 (1.67)	5 (4.17)	2 (1.67)	0 (0)	VII
	Total	24 (20.00)	53 (44.17)	27 (22.50)	16 (13.33)	120 (100.00)

Table explains about In overall comparison 28.33 percent have problem about high cost of plant protection chemicals and 19.17 percent respondents have problem in non-availability of labour in peak period and 15.82 percent respondents have problem about high cost of manures and fertilizers and 10.83 percent of respondents have problem about high cost of wages and 7.51 percent of respondents have problem about non availability of loan in-time and 10.1 percent of respondents have problem about incidence of pests and diseases.

Conclusion and Recommendation
On the basis of the findings in the research it was concluded that the highest number of respondents in terms of socio demographic profile were small size farmers. Talking about the profit in the paddy cultivation among different group of farmers the most benefited was the large size farmers that had the total profit followed by medium size farmers that and the least benefited was the marginal size farmers Problem of high cost of pesticides, managerial, high cost of fertilizers problem along with high wages of labour problem, non-availability of loan including risk and certainty were faced by the sample farms. Which were suggested to overcome by strengthening farmer's situation by Government agencies and financial institution.

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