

Comparative economic assessment of *kharif* paddy with and without agro-advisory services under AICRPAM-NICRA at Mahasamund district of Chhattisgarh

PRAVEEN KUMAR VERMA, J. L. CHAUDHARY and M. R. CHANDRAKAR*

Department of Agrometeorology, IGKV, Jagdalpur, (C.G.), India

**Department of Agricultural Economics, IGKV, Raipur (C.G.), India*

(Received 6 January 2014, Modified 10 March 2014)

e mail : rpr.aicrpam@gmail.com

सार - चावल छत्तीसगढ़ राज्य की मुख्य खाद्य फसल है और यह महासमुन्द जिले की सभी प्रकार की भूमि में (उच्चभूमि, मध्यभूमि तथा निचली भूमि) उगाई जाती है। इसमें अधिक पानी और अधिक लागत की आवश्यकता होती है। कृषि मौसम विभाग, आई जी के वी द्वारा चलाई जा रही एक्रिपाम-निकरा परियोजना (AICRPAM-NICRA PROJECT) के अन्तर्गत कृषि मौसम सलाह सेवाओं के प्रभाव को ध्यान में रखते हुए धान की फसल के उत्पादन, लागत और उनसे होने वाली आय का पता लगाने के लिए अध्ययन किया गया है। इसमें धान की फसल में मुख्य उत्पाद और सहउत्पाद की आय को शामिल किया गया है। जहाँ यह परियोजना चल रही है वहाँ के दो गांवों नामतः मालीडीह एवं झलखमरिया के 230 कृषकों का चयन किया गया है। इन कृषकों को सीमान्त (1 हेक्टेयर तक), छोटे किसान (2 हेक्टेयर), मध्यम किसान (2.01 से 4 हेक्टेयर) और बड़े किसान (4 हेक्टेयर से ऊपर) के रूप में वर्गीकृत किया गया है। वर्ष 2013 में खरीफ फसल की ऋतु में इस संबंध में विस्तृत रूप से जाँच की गई है। कृषि मौसम सलाह सेवा का अनुपालन करने वाले कृषकों तथा कृषि मौसम सलाह सेवा का अनुपालन न करने वाले कृषकों के कुल लागत और कुल लाभ का अनुपात क्रमशः 1.21 और 0.98 पाया गया है।

ABSTRACT. Rice is the main staple food crop and is grown in the entire land situation (upland, midland, lowland) with high water and input cost at Mahasamund district. The study was conducted to identify the cost and returns in production of paddy crop considering main product and bi-product values by understanding the impact of agro advisory services under AICRPAM-NICRA project driven by Department of Agrometeorology, IGKV. Two hundred thirty (230) farmers were selected randomly from two purposely selected villages namely Malideh and Jhalkhamriya where the project is in operation. The growers were classified as marginal (up to 1 ha), small (up to 2 ha), medium (2.01-4 ha) and large (above 4 ha) categories. The details enquiry was done in the kharif season 2013. It was observed that cost of cultivation comes down by 8.2 per cent by the farmers who follow AAS. Net cost: benefit ratio of AAS and non AAS farmers was found 1.21 and 0.98 respectively.

Key words – Economics, Cost of cultivation, Yield.

1. Introduction

Chhattisgarh state situated in eastern India stretches between 80°15' to 84°24' E longitudes & 17°46' to 24°5' N latitude. It covers total geographical area of about 13.5 million hectares and rainfed rice production has always remained a challenge in this region. Chhattisgarh popularly known as “Rice Bowl of India” occupies an area of around 3610.47 thousand hectares under rice crop with the production of 5.48 million tonnes and productivity of 1517 kg ha⁻¹ (Anonymous, 2010). Chhattisgarh farmers are mainly dependant on weather conditions for rice cultivation and production is largely affected by weather vagaries. Rice is mainly grown throughout the area in banded fields as farmers grow tall, long duration and photo-sensitive varieties. This state has three agro climatic zones, viz., Chhattisgarh plains, Bastar plateau and

Northern hills region. Climate of the state is of dry sub-humid type. Under wide range of farming situations and soil conditions, except upland light soil, rice is widely accepted and grown by the farmers depending upon their socio-economic conditions. During *kharif*, growing of rice is a tradition and is widely accepted depending upon farmers socio-economic conditions. While, in *rabi*, there are fewer options for the stakeholders to take profitable and/or suitable crops. Under these circumstances, they generally follow rice - wheat, rice - mustard and rice - winter vegetables under partially or assured irrigation and rice - fallow, rice - utera (Lathyrus, chickpea and linseed) under rainfed situation.

Mahasamund district is spread out in an area of 4970 sq km in the central-east of the state. The district lies between 20°31' latitude and 82°00' to 83°15' E longitude

surrounded by districts of Raigarh and Raipur of Chhattisgarh state and Nawapara and Bargarh districts of Orissa. This district was formed in July 1998 and it is having population of 1032754 as per Census 2011. Rice, wheat and Kodo-kutki are the three main crops of this district. However, rice crop in kharif season is the predominant crop covering acreage of 262841 hectares. Among pulses, urad, lathyrus and mung-moth are the main crops and groundnut and mustard are the main oilseed crops. Based on the visual observation in the operational area, the crop is being sown during the last week of June to mid July and under transplanted condition, seedlings were 30-40 days old when transplanted. The major rice varieties grown are MTU-1010, Mahamaya, MTU-1001, Karma Mahsuri and Swarna. Out of the entire rice grown area in this district, about 75-80% area is under broadcast sown method and rest area is under transplanting method of sowing. Here, in this paper, economic impact assessment of agro advisory services project (NICRA-AICRPAM) has been carried out in the crop growing season or kharif season of year 2013.

2. Data and methodology

The present study was purposely conducted in Mahasamund block of the same district under AICRPAM-NICRA project. It can be observed from Table 1 that out of 315 farmers, 230 farmers were selected for study purpose. Among the selected farmers 120 farmers follow agro advisory services (AAS) and 110 farmers do not follow AAS provided by AICRPAM-NICRA project from two intentionally selected villages namely Malideh and Jhalkhamriya under this project NICRA-AICRP on agrometeorology. Primary data was collected from selected agro-advisory service (AAS) farmers of neighbouring villages and non AAS farmers of neighbouring villages. Data was collected through personal interview method with the help of pre-tested questionnaires. The growers were classified as marginal (up to 1 ha), small (up to 2 ha), medium (2.01-4 ha) and large (above 4 ha) categories as per criterion followed by Marothia, 1986. The detailed enquiry was done in the kharif season of 2013. To estimate the cost of cultivation of selected paddy crop of different categories of farms, whole data is divided into two major parts, *i.e.*, variable cost and fixed cost. Variable cost includes land preparation, cost of seed and sowing, fertilizer and manuring, cost of intercultural operations, irrigation, plant protection materials, harvesting etc. Fixed cost carries rental value of land and interest on working capital. Different cost concept (cost A, cost B and cost C) analysis is made using these data to calculate the cost and returns of AAS and non AAS farmers of paddy crops as per standard procedure laid down by George *et al.*, 1972.

2.1. Economic analysis tools

This includes the detailed analysis of costs and returns of the individual crop enterprises as well as the farm as a whole, the various measures used for the analysis included:

(a) Total input

It includes all the cash and kind expenses as detailed below:

- a-1 Wages of hired labour paid in cash or kind.
- a-2 Imputed wages for the farmer and his family used in crop and livestock production.
- a-3 Value of seed, manure and fertilizers and other cash expenses.
- a-4 Cost of feed, fodder and concentrates.
- a-5 Repairs to dead stock.
- a-6 Depreciation on deadstock and livestock.
- a-7 Interest on fixed and working capital.
- a-8 Rent of land whether rented or owned.
- a-9 Irrigation charges.

(b) Total output

The quantity of product produced for different crops and livestock enterprises was treated as the total output. When the output is multiplied by its price then it is the output value (Banafar and Singh 1998).

(c) Net income

It is the difference between total receipts and total expenses. It includes the pay of the farm manager and interest on capital invested in the business. It was calculated as:

$$\text{Net income} = \text{Gross income} - \text{Total expenses}$$

(d) Net cost-benefit ratio

It can be expressed as the ratio of output to input. The ratio was calculated as:

$$\text{Net cost-benefit ratio} = O/I$$

where, I = Net cost of cultivation and

O = Net return

(e) Cost of production per quintal (Rs./qt.)

It refers to total input cost (in Rupees) divided by output (in Quintals) (Shrivastava, 1990).

TABLE 1
Distribution of sample growers in selected villages

S. No.	Name of village	Sampled paddy Growers				Total	Total No. of farm families
		Marginal (up to 1 ha)	Small (up to 2 ha)	Medium (up to 4 ha)	Large (above 4 ha)		
1.	Malideh	25	45	28	12	110	165
2.	Jhalkhamriya	20	50	40	10	120	150
	Total	45	95	68	22	230	315

TABLE 2
Average cost of cultivation of paddy in different category of farms (Rs./ ha)

S. No.	Particulars	Average cost with AAS	Average cost without AAS	Average saving with AAS	percentage saving with AAS *
(A) Variable cost					
1.	Field preparation	1368.09	1368.09	0	0
2.	Manure & fertilizer	3030.36	3530.36	500	12.4
3.	Sowing	1826.66	1826.66	0	0
4.	Transplanting	2180.65	2180.65	0	0
5.	Weeding	1266.67	1766.67	500	29.99
6.	Plant protection	1786.51	2286.51	500	19.37
7.	Irrigation	1645	2055	410	16.79
8.	Harvesting	1770.34	1770.34	0	0
9.	Threshing, winnowing & Transportation	1363.75	1363.75	0	0
	Sub-total	16238.03	18148.03	1910	11.13
(B) Fixed cost					
1.	Land rent	6980	6980	0	0
2.	Interest on working capital	175.93	190.93	0	0
	Total fixed cost	7155.93	7170.93	0	0
(C) A+B					
1.	Total cost (A+B)	23393.96	25318.96	1925	8.2

* Percentage was calculated from with AAS data

(f) *Cost concept*

The cost of production of paddy crop has been presented in terms of cost A, cost A₁, cost B and cost C. The cost concepts are given below (Niharika, 2012).

Cost A:

- * Value of hired human labour (permanent and casual)
- * Value of owned bullock labour
- * Value of hired bullock labour
- * Value of owned machinery
- * Hired machinery charges
- * Value of fertilizers
- * Value of manure (owned and purchased)
- * Value of seed (farm produce and purchased)
- * Value of insecticide and pesticide

- * Irrigation charges (both owned and hired)
- * Canal water charges
- * Land revenue and other taxes
- * Miscellaneous expenses (artisans, ropes and repair to small farm implements).

Cost A₁:

A₁ + Rent paid for lease in land (locally called as regha)

Cost B:

A₁ + Imputed rental value of owned land (lease, land revenue paid upon those) + interest on fixed capital (excluding land)

Cost C:

Cost B + Imputed value of family labour

TABLE 3

Cost of cultivation, product values and bi-product values

S. No.	Particulars	Average with AAS	Average without AAS	Gross benefit with AAS
1.	Cost of Cultivation (Rs./ha)	23393.96	25318.96	1925
2.	Production (Qt./ha)			
a.	Main product	37.15	35.87	1.28
b.	By-product	60.22	62.48	-2.26
3.	Price (Rs./qt)			
a.	Main product	1327.5	1327.5	0
b.	By-product	40	40	0
4.	Cost of production Rs./Qt			
	Main product	629.72	705.85	-76.14
5.	Return (Rs./ha)			
a.	Main product	49316.63	47617.43	1699.2
b.	By-product	2408.8	2499.2	-90.4
6.	Gross return (Rs./ha)	51725.43	50116.63	1608.8
7.	Net return (Rs./ha)	28331.47	24797.67	3533.8
8.	Net cost: Benefit ratio	1.21	0.98	0.23

3. Results and discussion

Economics Assessment of paddy crop with AAS and without AAS : It was observed from Table 2 that farmers who had followed agro advisory services had made notable saving in different operations like manure & fertilizer, weeding, plant protection and irrigation. Field preparations and sowing cost is coming out to be same as input here is mechanization and labour cost and during this time, no notable contribution of agro-advisory bulletins was observed. It was observed that farmers who follow NICRA-AAS have average saving of 12.4 per cent in manures and fertilizers, about 30 per cent in weeding, about 19.4 per cent in plant protection, 16.71 per cent in irrigation and the overall saving during crop growing season is 11.13 per cent. Manures and fertilizers saving could be done by AAS farmers as by following advice, saving in top dressing of urea was there. In plant protection also, a saving of Rs. 410 per hectare was made mainly focusing on the cost saving in spraying of herbicides/insecticides. However harvesting, thrashing, winnowing and transportation costs are coming out to be almost same under both the systems. Linear equation has been drawn and it can be observed from the Fig. 1 that cost towards various operations goes on decreasing during later part of the growing season. Major cost of production in rice crop is during initial stages. It can be seen that cost of cultivation comes down by 8.2 per cent by the farmers who follow AAS.

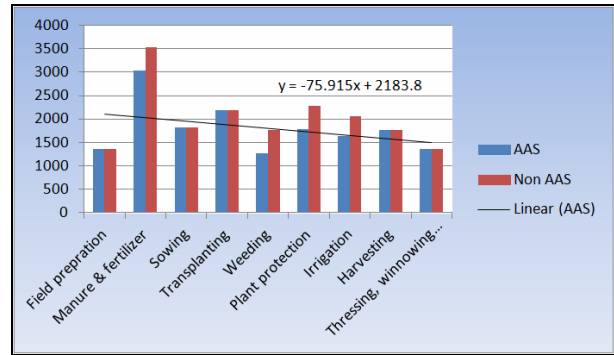


Fig. 1. Cost of cultivation with AAS and non-AAS farmers for various cropping operations

Results of cost of cultivation, product values and bi-product values have been shown in Table 3. Main product value is yielding more and therefore higher with AAS services (by about Rs. 1699) but bi-product return is decreasing (by about Rs. 90). Gross returns have been shown, therefore impact of agro-advisory services is clear with gross returns and net returns significantly higher. One term Cost of production (Rs. Per quintal) has been calculated for the main product/grain and the production cost comes down with AAS services farmers by Rs. 76.14 per quintal mainly because of better management and efficient practices followed by AAS farmers. Net cost: benefit ratio of AAS and non AAS farmers was found 1.21 and 0.98 respectively.

References

- Anonymous, 2010, "State level Agricultural statistics", Directorate of Agriculture, Raipur (C.G.).
- Banafar, K. N. S. and Singh, G. N., 1998, "An economic analysis of production and marketing of soybean in District Sehore M. P.", Thesis submitted to Department of Agricultural Economics C. S. Azad University of Agricultural and Technology, Kanpur, U. P.
- George, P. S., Choukidar, V. V. and Dave, M. P., 1972, "Consumption Pattern and Preferences for Rice, Centre for Management in Agriculture", Indian Institute of Management, Ahmedabad.
- Marothia, D. K., 1986, "Farm level constraints to high yielding of wheat and gram in Dharsiwa block of Raipur District of Madhya Pradesh", Research Report Ag. Eco. MPCST/ZARS/86-1 JNKVV, Raipur M.P., p41.
- Niharika, K., 2012, "Impact of institutional credit on small farm economy in the Raipur District of Chhattisgarh", Thesis submitted to Department of Agricultural Economics, IGKV.
- Shrivastava, S., 1990, "Analysis of growth trends in area production and productivity of red gram", *Indian Journal of pulses Research*, 4, 1, 81-85.