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ANALYSIS OF FARM BUSINESS OF PADDY CULTIVATION UNDER TRADITIONAL AND SRI METHOD IN DISTRICT PRAYAGRAJ, UTTAR PRADESH

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ABSTRACT: Indian agriculture is the backbone of India's economy. Of the rice is the one of the most important food crops in India. Rice production has seen a growth of 1.75 per cent which highest is food crops as compared to wheat it was 0.42 per cent. Rice belongs to the genus oryzae and family Graminae. The present study was conducted to work out cost and return structure of major issue with the tradition system of paddy cultivation in the area where paddy is main grown crop. It is alarming situation not for the India but whole world, water demand increasing day by day therefore, it is only option to follow alternate strategy e.g. SRI method of rice cultivation that could produce higher rice with the less water requirement as well as at low cost of cultivation. Hence, the study was concluded that traditional method was some what expensive in comparison to SRI method of paddy cultivation.

KEY WORDS: cost, return, benefit ratio, system, Rice, Production, cultivation.

India is the second largest rice producing country after China. Moreover, cultivation point of view India has large area under rice cultivation, as rice is one of the significant nutrient staple crops. The conventional method (inundation method or flood method) cultivation of paddy crop is facing a lot of problems than the SRI method. Since paddy is a water-intensive crop so its package and practice are closely depends on water availability. It is well known that about 70-80 per cent of freshwater withdrawal at worldwide stage is used for the farming function of them rice requires for about 85 per cent of water. Although paddy being an important water intensive crop which consumes 3000-5000 litres of water to produce one kg of rice as against the requirement of only 900 litres for wheat crop. Irrigation water supply is essential to increase the production and productivity of the major food grains hence, fast decline of irrigation water potential and increased demand for water from various sectors has been reducing the availability of water for agricultural sector, is causing a serious impact on the productivity of paddy in many parts of the country. Under such circumstances the system of rice intensification (SRI) method of paddy cultivation emerged as a best option for farmers. SRI method differs from the conservative method of rice cultivation (Rajkumar R 2013).

Table-1: Cost of cultivation of Traditional and SRI Method of Paddy

S. No.	**Particulars**	**Cost of Cultivation per hectare**			
		SRI Method		Traditional Method	
A.	Variables				
1.	Seed	78.02	0.64	1165.68	8.32
2.	Fertilizer				
A.	Nitrogen	390.32	3.21	377.85	2.7
B.	Phosphorus	729.84	6	731.84	5.22

C.	Potash	0	0	0	0
3.	Farm Yard Manure	775.71	6.38	459.12	3.28
4.	Plant Protection Chemical	63.21	0.52	50.02	0.36
5.	Human Labour	3721.95	30.62	5198.37	37.09
6.	Bullock Labour	2108.03	17.34	1352.69	9.65
7.	Machinery Labour	653.23	5.37	630.75	4.5
8.	Irrigation	166.23	1.37	954.72	6.81
9.	Interest on Working Capital @ 8%	173.73	1.43	218.42	1.56
	Sub Total	8860.26	72.9	11139.47	79.49
B.	**Fixed Capital**				
1.	Land Revenue	2.5	0.02	2.5	0.02
2.	Rent Value of Own Land	1250	10.28	1250	8.92
3.	Depreciation	852.69	7.02	286.95	2.05
4.	Interest on Fixed Capital @ 12%	84.21	0.69	61.58	0.44
	Sub Total	2189.4	18.01	1601.03	11.42
	Managerial Cost	1104.97	9.09	1274.05	9.09
	Total Cost of Cultivation	12154.63	100	14014.54	100

Source: Primary data based field Survey

Table-4: Prioritization of constraints in SRI method of paddy cultivation

SRI					
S. No.	Problems	Percent Position	Garret value	Mean value	Rank
	Management practices	5	82	63.84	I
	Lack of knowledge	5	85	62.95	II
	Lack of water availability	15	70	55.96	III
	Lack of getting skilled labour	25	63	51.8	IV
	Non-availability of machines and tools	35	57	51.76	V
	Disease and pest attack	45	52	48.5	VI
	Lack of guidance from Govt. officials	55	47	44.18	VIII
	Lack of confidence in taking new technology	65	42	45.7	VII
	Non-availability of pesticides or other chemicals	75	36	40.52	X
	Non-availability of cash or credit	85	29	43.08	IX
10.	Non-availability of quality seed	95	18	51.38	VI

Source: Field Survey

RESEARCH METHODOLOGY: There were hundred respondents selected for the study. The data was collected through pre tested designed schedule purposively. Total respondents were directly interview; information was based on their knowledge. The research methodology of SRI method is based on four main principles that interact with each other early, quick and healthy plant establishment. Reduced plant density. Improved soil conditions through enrichment with organic matter. Reduced and controlled water application. The research methodology of SRI methodology clearly establishes path to

the farmers for the cultivation of paddy easily. Research methodology gives many research methods to the farmers by researching in many ways.

Nature of Data: For the present study, necessary primary data were obtained from the respondents through personal interview with the help of pretested and well-structured survey schedule and observation methods.

Tools of Analysis

Estimation of costs and returns:

The farm management, cost concept approach is widely used in India for evaluating crop profitability in production. The cost concepts in brief, are Cost A1, A2, B1, C1, C2 and cost C3

COSTS A1: this gives the total cash expenses incurred the owner or operator. It included the following terms of costs.

Value of hired human labour

Value of bullock labour

Value of machinery charges (except depreciation)

Value of fertilizers and manures.

Value of seeds.

Value of insecticides, pesticides and weedicide

Irrigation charges

Depreciation on farm implements

Interest on working capital

Land revenue paid to government

Cost A2= Cost A1+ Rent paid for leased in land, if any

Cost B1= Cost A1+ Interest on value of owned fixed capital assets

Cost B2 = Cost C2+ 10% of Cost C2 on account of managerial functions performed by the farmer.

In the present study, the rent paid for leased in was zero, as none of the sample farmers took land on lease. Hence, cost A1 and cost A2 are similar.

Rates of Returns over Different Cost Concepts

Gross Income: Yield of main product (in kg/acre)x their prices (Rs.) + Yield of by product (in kg/acre) and their prices (Rs.)

Net Income: Gross Income – Cost C.

Farm Business Income: Gross Income – Cost B

Farm Investment Income: Farm business income- wages of family labour

Family Labour Income: Gross Income – Cost B

For achieving the second objective simply Garret's ranking technique was used Garrett's ranking technique

Implicit cost: cost of total variable inputs

Explicit cost: insurance or rental value

CB ratio: Gross income

Total cost

RESULTS AND DISCUSSION

The productivity and income from the crop production can be judged in better way, if we analyses it with respect to the different costs incurred during cultivation of a particular crop. The cost of cultivation and cost of production of any crop is the most important aspect of the farm economy both at micro and macro level point of views; it provides guideline to the government in promulgating the price policy both for factors of production and the produce. Input wise cost worked out in two broad heads namely variable cost and fixed cost includes cost of human labour (family and hired), machinery labour, seeds, manures, fertilizers, pesticides, herbicides and interest on working capital. On the other hand, fixed cost involves land revenues, rental value of owned land and depreciation (4). The study revealed that SRI method has been found to be considerably more profitable than traditional method in study area due to low input expenditure. The total cost of cultivation was higher in traditional method (Rs 14014.54./acre) than SRI method (Rs 12154.63 per acre) in paddy cultivation. Average variable cost was observed Rs. 8860.26 under SRI method while in traditional method it was observed Rs. 11139.47 per acre. Expenditure on seed was higher in traditional method due to high quantity of seed used. It was found that, human labour cost was the major variable component in both SRI and

traditional method i.e., Rs.3721.95 and Rs.5198.37 per acre respectively. It was calculated on the basis of wage rate prevailing in study area. The percentage expenditure incurred on Irrigation component was more in traditional method i.e., 6.81 percent while in SRI it was 1.37 percent of total cost of cultivation. It is because SRI required less water than traditional method. It also indicates that the water use efficiency pattern followed in SRI method of paddy cultivation. Managerial cost was calculated as a fixed cost component that was 10 percent (Table-1). It was observed at the time of data collection that there is no rent paid for leased in land in study area. So, Cost A1 and Cost A2 were same in both the SRI and traditional methods. Per acre Cost A, B and C for traditional method were more when compared to traditional method. For example, Cost C3 was more about Rs. 1859.91 per acre for traditional method when compared to that in SRI method. Cost A1, A2, B1, B2, C1, C2, and C3 are given in (Table-2). The return structure in paddy cultivation in the study area is given in (Table-3). The yield realized in traditional method was 1560.06 kg per acre, while it was 1821.17 kg per acre in the SRI method of paddy cultivation. The yield differences were mainly because of more number of productive tillers per meter square in SRI and due to spacing maintenance principle followed by SRI cultivators. The gross return was calculated from raw data was Rs. 27661.29 per acre under SRI method and in the traditional method it was Rs. 22365.69 per acre. So, the difference of gross return gained from SRI and the traditional method of Paddy cultivation was Rs.5295.6. Where the net income of SRI method varied about Rs.7342.02 from traditional methods. The net income gained from SRI was almost double as compared to traditional method, the net income was Rs. 15506.66 in SRI method and in traditional it was Rs. 8351.15. It was revealed from the table that the Net Cost was Rs.5130.64 per acre in the SRI method where in the traditional method it was Rs.8873.76 per acre. Net Cost is almost double in the case of traditional method with a comparison to the SRI method of Paddy cultivation. Cost of production, which is the ratio of net cost and output, was highest in traditional method Rs.5.69 per kg. As comparison to SRI method Rs 2.82 per kg. The return per rupees investment was around Rs. 2.28 and 1.60 over variable cost under SRI and traditional method respectively. The farmers were asked to list priority wise ten major constraints they were facing in SRI method of paddy cultivation. All these were sorted, screened and give them a rank according to the Garrett method. The study revealed that the constraint Management Practices' was the biggest constraint in SRI method of paddy cultivation with the mean score of 63.84, followed by 'Lack of water availability' with the mean score of 55.96. SRI method was new to them, management practices are little different, they could not have carried it out properly. 'Lack of getting skilled labour' was the third major constraint in SRI system with the mean score of 51.8. The other constraints expressed by the sample farmers were non -availability of machines and tools, 'Non-availability of quality seed, Disease and pest attack, Lack of confidence in taking new technology, Non-availability of cash or credit, etc. The SRI method was optimized with the help of ATMA in study area they gave 'conoweeder', seed, pesticide etc. for promotional purpose (Table-4).

Table-2: Cost structure of paddy under SRI and traditional methods.

COST	SRI (Rs/acre)	TRADITIONAL Rs/acre
A1	7538.42	8898.85
A2	7358.42	8986.85
B1	7442.63	9048.43
B2	8692.63	10298.43
C1	9737.66	11490.49
C2	11049.66	12740.49
C3	12154.63	14014.54

Economic Analysis of Cost and Return Traditional and Sri Method: A Comparative Structure of Paddy Cultivation under Study

Table-3: Return structure in SRI and traditional methods of paddy cultivation

Rate of Return Over Different Cost Components		
Particulars	SRI	TRADITIONAL
Gross Return	27661.29	22365.69
Income		
Net Income	15506.66	8351.15
Farm Business Income	20302.87	13378.84
Farm Investment Income	17945.83	10936.78
Farm Labour Income	18968.66	12067.26
Cost of Production		
Net Cost	5130.64	8873.76
Output	1821.17	1560.06
Cost of Production	2.82	5.69
B:C Ratio		
B:C Ratio on Total Cost	2.28	1.6

Summary and Conclusion

His findings of this study demonstrate the superiority of SRI in terms of yield and returns advantage. However, it is worth mentioning here that the actual adoption rate of SRI among paddy growers is very low, these observation calls for urgent needs of popularizing the SRI method such as government, NGOs, and other agencies should take initiative and enhanced the extension services for SRI method. Skilled labour requirement particularly for transplanting and weeding operations was the major constraint in paddy cultivation under SRI method. So, timely guidance to the farmers and Agricultural labours through extension agencies (KVK, NGOs) should be ensured.

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