



A socioeconomic study on pros and cons of SRI method of paddy cultivation in Ormanjhi block of Ranchi district, Jharkhand, India

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Received: 01-09-2016

Accepted: 08-12-2016

DOI:10.18805/ijare.v0i0.7008

ABSTRACT

Rice is a staple food for more than half of the world's population. World rice production nearly doubled since the 1960s to the 1980s, mainly due to the green revolution. A major issue with the traditional system of paddy production, particularly green revolution technology is input intensive and favors cash rich farmers. Increasing prices of agricultural inputs prevent poor farmers from completely adopting modern production technologies. Water demand by rice farmers were also continue increasing under such circumstances, any strategy that could produce higher rice yields with less water and less expenditure is the need of the day. Under such circumstances the system of rice intensification (SRI) method was suitable and followed by the farmers. System of rice intensification is a method for increasing the productivity of rice cultivation while at the same time reducing inputs, including seeds and fertilizers, and water requirements. The present study was conducted in Ormanjhi block of Ranchi district, to study the socio-economic profile of paddy growers, perception and constraints confronted by paddy growers under SRI method of paddy cultivation. Study revealed that the major constraints in SRI production were lack of awareness, scarcity of skilled labour, nursery management, and drudgery in cono-weeder uses. The major perception regarding SRI method of paddy cultivation were low demand of water, higher yield, remuneration from government, low seed requirement, low costs of input uses.

Key words: Adoption, Constraint, SRI method of paddy cultivation.

INTRODUCTION

Rice is the staple food of Jharkhand more than 80 percent of the agriculture land is covered by paddy as the main food crop. It's grown in area of 1.4 million hectare with a production of 3.1 million tonnes (GOI, 2012). Paddy based agriculture is the mainstay of Jharkhand economy. Compound Annual Growth Rate of rice production in Jharkhand shows a declining trend with a growth rate of -0.7 per cent per annum during 2007-08 to 2011-12. The negative growth trend of rice production is mainly attributed by areas growth rate. The productivity of rice increased marginally in same period. Paddy grown practice in Jharkhand is mainly through conventional method due to this production and productivity of paddy is low. Higher production and yield of paddy can be obtained under irrigated rice production system, large investment in the form of equipment and external input requirement of irrigation infrastructure is a challenge to subsistence rice producers. Despite receiving a high amount of rainfall, the state is able to produce only half of its food grains requirement, when the country is surplus by 9 per cent. Highly erratic rainfall with the old and traditional cultivation practices followed by a majority of the farmers have only compounded the problem resulting in very low yield, compared to the yield in rest of the country. Demand of water for paddy cultivation

is also increasing continue under such circumstances, any strategy that would produce higher rice yield with less water and less expenditure is the need of the day. Under such circumstances the system of rice intensification (SRI) method is suitable. Cultivation of paddy through SRI method provide one such important solution to grow it with less water and less seed and has been gaining popularity not only in India but across the globe (NABARD report, 2012). SRI method of rice cultivation was developed by Fr. Henri de Laulanie in Madagascar in 1980. SRI is a new system of rice cultivation for increasing rice productivity with a comprehensive package of practices involving less seed, water, chemical fertilizers and pesticides. The rapid dissemination of this system lies in the fact that it increases rice yields dramatically without requiring extra seeds, chemical fertilizer or other external inputs (Devi and Ponnarasi, 2009). The major features of SRI are :

Nursery management: Firstly, raised seed bed prepared by a well mixture of FYM and soil either on polythene covers, banana sheaths etc. or on soil itself, Secondly, seed rate five kg per hectare is sufficient as against 50 to 62.5 kg in conventional method. Thirdly 8 to 12 days aged seedling transplantation with two small leaves and seed attached to the plant as against 25 days and above in conventional

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method of rice cultivation. (Haldar, Honnaiah and Govindaraj, 2012). Paddy is a major crop of Jharkhand but water scarcity problem from last 4-5 years decreases the paddy production and productivity in Jharkhand. Under such circumstances the system of rice intensification (SRI) method of paddy cultivation is an alternative approach to overcome this problem which is suitable and followed by the farmers. In adoption of SRI method farmers having some constraints. So if we could identify and remove the constraints than SRI method of paddy cultivation would be good for farmers in terms of production and productivity. The major objectives of the study are: to identify the socio-economic profile of paddy growers under SRI and conventional method of paddy cultivation, to analyze the perception and constraints confronted by paddy growers under SRI method of paddy cultivation.

MATERIALS AND METHODS

The study was based on the input and output data obtained from the respondents in Ormanjhi block of Ranchi district, Jharkhand. For selection of respondent's multistage sampling design was employed. In this procedure, at first stage Ranchi district selected purposively. From Ranchi district Ormanjhi (paddy growing) blocks following both traditional and SRI method of paddy cultivation were purposively selected. The block was selected purposively because of the earlier experience of work in the same block. Then at third stage, five major paddy growing villages Hindebli, Kuchu, Tapa, Khulsi and Bundufollowing traditional and SRI method of paddy cultivation was selected from Ormanjhi block. In the final stage, 20 farmers were randomly selected from each villages comprising ten farmers for traditional and ten farmers for SRI method of paddy cultivation. Thus, the total sample size was 100.

Nature of data: For the present study, necessary primary data were obtained from the respondents through personal interview with the help of pre-tested and well structured survey schedule and observation methods. The data so collected pertained to the *kharif* season of the agricultural year 2015-16.

Analytical approach: Descriptive statistical analyses such as mean, percentage, frequency, maximum etc. were carried out for making a comparison of general characteristics of sample farms and in other analyses wherever is necessary. For analyzing perception and constraints of SRI method, Garrett's ranking technique were used.

Garrett's ranking technique

$$\text{Percent position} = \frac{100 (R_{ij} - 0.50)}{N_{ij}}$$

Where

R_{ij} is the rank given for i^{th} item by the J^{th} individual

N_{ij} is the number of items ranked by the J^{th} individual.

The percent position of each rank was converted into scores using Garrett table. For each constraint, scores of individual respondents were added together and were divided by the total number of respondents for whom scores were added. Thus, the mean score for each constraint was ranked by arranging them in descending order.

RESULTS AND DISCUSSION

The study covered a samples of 100 paddy growing farmers consisting 50 respondents who followed SRI method and 50 from traditional method of paddy cultivation. Socioeconomic profile of the respondents are presented in Table 1

Age: In this study (Table 1) the age group was categorized into 3 categories, i.e. young (<35), middle (35-50) and old (>50) aged group. Out of 50 respondents the number of family members in young age group 10 for SRI and 7 for traditional method. The highest age percentage was observed in old age group i.e. 48 per cent in case of SRI it's reflecting the experience of farming. Whereas in case of traditional method highest percentage recorded in middle aged group i.e. 52 per cent.

Sex: It was observed from the tabulated data that under SRI method male, female percentage was 88 and 12 percent while under traditional method 100 per cent respondents were male. It indicated that under SRI method female play a pivot role in decision making activity.

Occupation study (Table 1) revealed that under traditional method 100 per cent farmers were engaged in

Table 1: Socio economic characters of the respondents in study area

Variables	Method of cultivation			
	SRI		Traditional	
	Frequency	Percentage	Frequency	Percentage
Age				
Young(<35)	10	20	7	14
Middle age(35-50)	16	32	26	52
Old(>50)	24	48	17	34
Total	50	100	50	100
Sex				
Male	44	88	50	100
Female	6	12	0	0
Total	50	100	50	100
Occupation				
Farming	42	84	50	100
Farming + labour	0	0	0	0
Farming +Service	8	16	0	0
Farming + Business	0	0	0	0
Total	50	100	50	100
Caste				
General	5	10	12	24
OBC	22	44	27	54
ST	23	46	11	22
Total	50	100	50	100

purely farming activity while in case of SRI method 84 per cent purely in agriculture and 16 per cent was engaged in farming plus other activities.

Caste: In study area no respondents were belonged to schedule caste. The respondents were from general, OBC and ST category. In both (SRI and traditional) method of paddy cultivation highest respondents were from OBC category.

Cropping pattern refers to the number of crop raised on a field during an agriculture year. It was revealed from the study (Table 2) that in kharif season respondents were growing mainly paddy, maize and finger millet, in rabi season wheat followed by potato and other vegetables. Crops cultivated during summer seasons were chili, cucurbits, tomato, vegetables and pulses. Total cultivated area under SRI system was observed 155.55 acre while in case of traditional method it was 198.4 acre. AGCA (Average Gross Cropped Area) under SRI method was recorded 3.16 acre as compared to traditional method 3.96 acre. In terms of percentage, 38 per cent area allocated for paddy cultivation under SRI method while 39 per cent allocated for paddy cultivation under traditional method.

Asset position: It is included the land holding, livestock, farm equipment and implement position. It indicates the risk bearing capacity of the respondent. Average size of land holding was 1.38 acre and 1.27 acre under traditional and SRI method respectively. In livestock composition both traditional paddy farmers and SRI paddy farmers was dominated by higher numbers of poultries. SRI paddy farmers comparatively had more number of livestock than traditional paddy farmers 18.27 and 16.99 respectively. Traditional paddy growers had more number of implement

than SRI paddy growers i.e. 9.21 and 8.00 respectively. Out of total implement kudal was the major implement in study area (Table 3)

For the measurement of adoption reason data was collected from the respondent who were growing paddy through SRI method. Some reasons were identified here and analysed with Garrett ranking method.

It was observed from the study (Table 4) that low demand of water was the main reason for adoption of SRI method. With the mean score of 67.6 it has the first rank. Paddy cultivation in the study area was totally under rainfed condition and due to lack of rainfall water in last two years adoption level of SRI method has increased. With the mean score of 60.75, higher yield was the second important reason. It was also revealed from the analysis of field data that paddy cultivation under SRI method had higher yield with less cost. Remuneration from the government was the third main reason for adoption of SRI method with 53.3 mean score. In the study area government and government agency were providing subsidized input like Conoweeder and plant protection chemical along with technical knowledge. In some area SRI cultivators were receiving Rs 500 from the ATMA as a motivational and promotion purposes. Low seed requirement and less cost of input uses were the fourth and fifth reason for adoption of SRI in the study area with the mean score 50.35 and 35.00 respectively. - The lower cost of cultivation under SRI was mainly attributed to lesser seed requirement under SRI than traditional method of paddy cultivation. It was also observed at the time of data collection that in SRI method, respondents were using 2-5 kg seed per acre while traditional cultivators were using 16-22 kg seed per acre. Due to this difference in seed quantity pattern cost

Table 2: Cropping pattern followed by respondents in study area (Acre)

Particulars	SRI		Traditional	
	Total Cultivated Area	Average Sown Area	Total Cultivated Area	Average Sown Area
Kharif				
Paddy	60.85	1.2	77	1.54
Maize	14.5	0.29	21.5	0.43
Marua	0.5	0	2.5	0.05
Rabi				
Wheat	30.2	0.6	19.2	0.38
Vegetables	11.5	0.2	15	0.3
Potato	10.5	0.21	20.3	0.4
Summer				
Chili	3.5	0.1	6.7	0.13
Cucurbits	6.5	0.13	8.5	0.17
Tomato	3.5	0.1	12	0.24
Vegetables	11.5	0.23	11.2	0.22
Pulses	2.5	0.1	4.5	0.06
GCA		3.16		3.96

Table 3: Assets position of the respondents in study area

Particulars	SRI	Traditional
Land Holding (Acre)	1.27	1.38
livestock		
bullock pair	0.48	0.40
cows	0.92	0.78
buffaloes	1.11	1.56
calves	0.04	0.14
heifer	0.46	0.44
goat	6.96	4.72
poultry	6.96	6.16
duck	1.34	1.41
total	18.27	16.99
implements		
kudal	2.48	2.42
Khurpi	2.14	1.86
Hasua	1.58	3.53
Desi plough	1.06	1.00
Iron plough	0.40	0.00
Sprayer	0.34	0.40
Total	8.00	9.21

Table 4: Reason of adoption of SRI method of paddy cultivation

Reasons	Percent position	Garret Value	Mean score	Rank
Remuneration from Government	8.33	77	53.30	III
Higher production or yield	25.00	63	60.75	II
Low demand of water	41.66	55	67.60	I
Less fertilizer requirement	58.33	46	31.10	VI
Low seed requirement	75.00	37	50.35	IV
Low cost of input uses.	91.66	23	35.00	V

Table 5: Prioritization of constraints in SRI method of paddy cultivation

Constraints	percent position	Garret Value	Mean score	Rank
No suitable land	5	82	37.32	VIII
Availability of FYM	15	70	47.42	VI
Using of marker	25	63	49.18	V
Skill labour required in transplanting	35	57	52.98	IV
Nursery Management	45	52	64.20	I
High labour requirement	55	47	56.50	III
Manual conoweeder operation	65	42	58.24	II
High cost of input uses	75	36	42.20	VII
Lack of irrigation facility	85	29	29.98	X
Weed management	95	18	35.66	IX

was also differ from SRI to the traditional method of paddy cultivation.

Constraints in practicing SRI method of paddy cultivation

The farmers were asked to list priority wise ten major constraints they were facing in the SRI method of paddy cultivation. All these were sorted, screened and give them a rank according to the Garrett method.

A perusal of Table 5 revealed that nursery management was the biggest constraint (mean score of 64.2) followed by manual conoweeder operation (mean score 58.24), a high labour requirement (mean score 56.50), need of skilled labour (mean score 52.98), using of marker (mean score 49.18), availability of FYM (mean score 47.42), high cost of input uses (mean score 42.20), no suitable land (mean score 37.32), weed management (mean score 35.66) and lack of irrigation facility (mean score 29.98).

CONCLUSION

The findings of this study demonstrated the pros and cons of SRI method of paddy cultivation in Ormanjhi

block of Ranchi district, Jharkhand. The changing scenario of climatic factor has increased the demand of water for traditional rice cultivation. So in present circumstances SRI solves the burning problem of water scarcity, and SRI shows the superiority in terms of production, yield and return parameter. But with the superiority over traditional method, it has several reasons for less adoption of farmers to SRI method i.e. nursery management followed by manual conoweeder operation, requirement of skilled labour etc. The farmers training to impart skill for nursery management, weeding in SRI method should be organized by SAU, KVK, NGO. these observations call for urgent needs of popularising the SRI method such as government, NGOs, and other agencies should take initiative and enhanced the extension services for SRI method, to organise seminar, workshop, training and demonstration programme on SRI method of paddy cultivation. Timely guidance to the farmers from the extension agencies and to the persons involved in the transfer of technology.

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