

Variations in Adoption of System of Rice Intensification (SRI) in Kerala

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ABSTRACT

The present study was undertaken to analyse the variation in adoption of System of Rice Intensification in Kerala. An ex-post-facto research design was followed for the study conducted in selected three districts of Kerala. A total of 200 adopter categories representing small, medium and large farmers were taken as sample. The sample categories under the study comprise the beneficiaries of System of Rice Intensification(SRI) schemes implemented under various projects. Data collection was done through interview method. The area under SRI out of the total paddy area among adopter categories was nearly half in Rabi season. More than half of the farmers have adopted SRI continuously for 3 years without change in area. Nearly one-third of the farmers have not adopted SRI continuously for the last three years. With respect to nutrient management majority of the farmers adopted both organic and inorganic fertilizers. Variation in adoption was seen with respect to adoption of SRI cultivation. Under full adopter category more than three fourth of the respondents adopted single seedling planting, use of mat nursery, planting 8-12 days old seedling and square planting. Adoption of correct seed rate and application of organic manures was also not followed by more than half of the farmers. However under non-adoption category it was seen that nearly one-third of the farmers did not adopt correct seed rate.

Key words : Adoption, System of rice intensification, farmers, Variation

India has the largest area of 44.6 million ha under rice in the world and ranks second in production next to China. Rice is the staple food and its demand is ever increasing in India. Rice is grown in 534 districts spread across 30 states and Union Territories of the country.

Further intensification of irrigated rice farms is necessary to feed the growing population and to maintain food security in the near future. Rice farmers, however, face several problems: stagnating yield; declining profit, less land, water, labor for rice cultivation; crop failures due to adverse weather; high post-harvest losses; and growing environmental concerns. Rice is a profligate in use of water, consuming half of all fresh water resources. Agriculture consumes 75% of total water use in India of which 70 per cent is utilized for rice cultivation. In an agrarian country like India, intensified efforts to improve both crop and water productivity and subsequently the farmers income is a vital need of the hour. The extensive efforts to relieve off from the threats of water scarcity have resulted in efficient water management practices in wetland rice through System of Rice Intensification(SRI). Reports indicate that SRI can increase farmers current rice yield two or three fold (Uphoff2002). The emergence of SRI in India was slower as compared to other rice growing countries. In Kerala trials on SRI was conducted by various agencies and Kerala Agricultural University. However the discontinuance of technology was seen among the farmers due to various reasons. Keeping the above fact in view the present study was formulated to study the variation in adoption of SRI core components.

METHODOLOGY

Kerala state comprises on 14 districts representing 5 main agroecological zones. Out of the

14 districts Palakkad and Malappuram from Central zone and Trivandrum district from Southern zone of Kerala are purposively selected for the study based on the rice area and adoption level of farmers on SRI cultivation. Two hundred farmers of different adopter categories were selected in consultation with extension professionals. The sample of farmers comprise the SRI beneficiaries of various central and state government schemes. A structured interview schedule was prepared for assessing the adoption level in SRI cultivation. The selected farmers were interviewed personally and post stratified into three groups as Marginal, Small and Big farmers. Data collection was started from December 2009. The data were presented in frequency and percentage basis to draw inferences.

Variation in adoption of SRI practices

Adoption of core components SRI farmers were post classified as Full adopters, Partial adopters and Non-adopters which is given in Table 1. The classification is discussed below:

- 1) Full Adopters who completely adopt defined core components. A full adopter is one who uses less than 10 Kg/ha seeds, raised in mat nursery, transplanting in 8-12 days old seedling in 30 X 30 cm or 25X 25 cm spacing of square planting method along with 2-3 times cono weeding and applying only organic manures for nutrient application.
- 2) Partial adopter who partially adopts SRI defined core component. A partial adopter is one who uses 10-20 Kg. ha seeds raised in modified mat nursery, transplanting 14-15 days old seedling in 22.5 X 22.5 cm spacing of square planting method along with one time cono weeding and applies organic and inorganic fertilizer for nutrient application.
- 3) A non adopter who deviates the SRI defined core components. A non adopter is one who uses more than

Table 1

Variation in adoption of core components of SRI technology compared with conventional method

Concept of core component	Conventional method	Criteria of core components of SRI adoption		
		Full adoption	Partial adoption	Non adoption
No of seedlings	>4	1	2-3	>3
Nursery method	Flat bed	Mat	Modified	Normal flat bed
Seed (Kg/ha)	80-100	<10	10-20	>20
Age of seedling	25-35	8-12	14-15	>15
Square planting(cm)	15x10 15x15	30x30 25x25	22.5x22.5	Row planting
No.ofcono weeding	Manual	2-3 times	1 time	Manual
Organic manure	Organic+inorganic	Only organic	Organic +Inorganic	Inorganic

20 Kg /ha seeds raised in normal flat bed transplanting more than 15 days old seedling in row planting along with manual weeding and applies only inorganic fertilizer.

RESULTS AND DISCUSSION

Adoption of an innovation involves continue use of the innovation as the best course of action. During the process of SRI adoption it involves set of practices such as a) planting of young seedling with wide spacing b) seedling planted singly c) weeding and aeration d) moist but unflooded soil condition and e) nutrient application through organic manure application.

The purpose of following the SRI management practices involves certain benefits for the crop growth Viz., 1) planting single young seedling with wide spacing which preserves plants potential for massive tillering and root growth that is lost by latter transplanting and the wide spacing which helps to avoid competition among plant roots for nutrients ii) weeding is done at 10 days interval by cono weeding 2-3 times depending on the duration of the crop which ensures that the upper horizon of soil is aerated and weeds are removed. The weeds removed also serves as a green manure iii) Less seed requirement i.e., 5 Kg seed raised in a nursery area of 40 m² iv) adopting alternate wetting and drying up to flowering stage so that the soil is kept moist and less water is required than conventional method v) nutrient application with organic manure ensures a healthy crop.

From Table 2 it is seen that majority of the farmers (59.00%) are marginal farmers followed by small farmers (27.50 %) and large farmers (13.50 %). It might be due to the fact that constant attention needed for adoption of SRI. Hence farmers with less area could adopt SRI easily than large farmers who depend more on hired labour. This findings derives support from the finding of Suresh(2006) and JalaSpandana(2008).

Area allocated by rice farmers under SRI and

Table 2

Distribution SRI farmers according to their farm size

Farm category	Number	%
Marginal (<1 ha)	118	59.00
Small (1-2 ha)	55	27.50
Large (>2 ha)	27	13.50
Total	200	100

non SRI methods were estimated during 2008-09 , 2009-10 and year 2010-11. The share of SRI area to total paddy area was worked out for each season and presented in Table 3. From the Table it could be inferred that in Kharif season the SRI area increased from 18.23 per cent in 2008-09 to 23.53 per cent in 2010-11. In Rabi season the SRI area increased from 42.94 per cent in 2008-09 to 47.06 per cent in 2010-11. In summer season the SRI area increased from 0.24 per cent in 2008-09 to 7.65 per cent in 2009-10 and again regained the same area in 2010-11. This shows that farmers preferred SRI during the second season only because of heavy rainfall experienced during the first season and the reason for low area during summer season is due to the scanty water availability during the summer months.

Change in SRI adoption status

The pattern of SRI adoption in different seasons was assessed. Three categories of rice farmers were made , namely, 1) no change in SRI area in 2010-11 over 09-10 2) reduction in SRI area in 2010-11 over 09-10 3) increase in SRI area in 2010-11 over 09-10. The results are presented in Table 3. It is seen that more than half of the farmers in kharif and 53 per cent farmers in rabi seasons have adopted SRI continuously for three years without change in area. However SRI adoption in summer season is least in Kerala except in few pockets where assured irrigation is present. The reduction in area is seen to a lesser extent between 4.5 to 15.50 per cent. The increase in area was seen only in rabi season by only three farmers. However non adoption of SRI was seen prominently during kharif

and summer season which is due to excess and limited rainfall received in Kerala.

Table 3

Adoption of SRI techniques under different seasons

Details	2008	2009	2010
Number of SRI sample farmers	200	200	200
Average land area			
I.Kharif season			
a. Area under rice(ha)	1.70	1.70	1.70
b. Area under SRI(ha)	0.31	0.41	0.40
c. Per cent of SRI area	18.23	24.11	23.53
II Rabi season			
a. Area under rice(ha)	1.70	1.70	1.70
b. Area under SRI(ha)	0.73	0.92	0.80
c. Per cent of SRI area	42.94	54.11	47.06
III Summer season			
a. Area under rice(ha)	1.70	1.70	1.70
b. Area under SRI(ha)	0.07	0.13	0.07
c. Per cent of SRI area	0.24	7.65	0.24

Table 4

Adoption of core components of SRI

SRI component	Full adoption		Partial adoption		Non adoption	
	No	%	No	%	No	%
No of seedling	168	84.00	32	16.00	-	-
Nursery method	151	75.50	45	22.50	4	2.00
Seed Kg/ha	82	41.00	45	22.50	73	36.50
Age of seedling	162	81.00	38	19.00	-	-
Square planting(cm)	154	77.00	43	21.50	3	1.50
No of conoweeding	143	71.50	25	12.50	32	16.00
Organic manure	23	11.50	141	70.50	36	18.00

Variation of SRI with core components

The SRI farmers adopting different core components were grouped into full adopters, partial adopters and non adopters based on the extent of adoption. It is seen that 84 per cent of farmers adopted single seedling planting and only 16 per cent partially adopted the single seedling. This may be due to the implementation of different schemes operated on SRI. Similar results were reported by ICRISAT-WWF project(2008b) Under the nursery method mat nursery was adopted by more than three fourth (75.50 per cent) of the farmers and only 2 per cent of the farmers adopted the conventional method of nursery raising. Though SRI required 10 Kg seed for nursery

preparation it is seen that only 41 per cent of the farmers adopted seed rate while 36.50 per cent of farmers adopted excess seed rate of more than 20 Kg. In case of age of seedling 8-12 days seedling is expected to boost yield parameters like productive tillers, grain yield and grain weight but it is seen that 81 per cent of farmers adopted planting in the right time. In case of square planting a vast majority i.e., 77 per cent adopted planting fully while the remaining farmers feel that it is labourious and requires lot of skill. In case of cono weeding nearly half of the respondents did not adopt two times cono weeding due to labouriousness and non availability of weeder. This finding is in consistent with Johnson et al.(2012). With respect to organic manure application majority (70.80 per cent) of the farmers adopted both organic and inorganic fertilizers.

CONCLUSION

It can be concluded that there is immense scope for SRI or little modified SRI in Kerala due to substantial improvement of rice area and productivity among the farmers of Kerala. Adoption of SRI across the country would require a change in the mindset of farmers, who need exposure to best practices, technology transfer through community approach in raising nursery, skill up gradation of labour, adequate and timely availability of simple mechanical implements such as markers and conoweeder. Any new technology when introduced for the first time in the farmers field will face lot of hindrances. Farmers who have practiced the SRI for two to three seasons could easily overcome the difficulties. Further delineating the areas suitable for SRI cultivation should be made so as to avoid the failure. Training of farmers and agricultural extension professionals is the need of the hour and special drive is necessary from the planners to prepare an SRI map for Kerala in giving recommendations suited to the area. As far as Kerala is concerned rice farmer groups already exist and hence it is easier for the extension machinery to rectify the constraints and make SRI cultivation a culture in Rice cultivation and full adoption of the practices recommended.

Paper received on : November 16, 2014

Accepted on : December 20, 2014

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