

## Constraints of the farmers in adoption of SRI method - An analysis

Plabita Ray\* and T Barik

College of Agriculture, Orissa University of Agriculture and Technology, Bhubaneswar-751003, India

\*Email: raj\_rabindra@rediffmail.com

### ABSTRACT

*The System of Rice Intensification (SRI) method appears to be a viable alternative for rice cultivation. But, it is found to be difficult for most farmers to practice. A study was undertaken with 115 farmers adopting SRI to assess their constraints in adoption of SRI. Analysis of data revealed that the farmers expressed the benefits of higher production, more profitable, compatible to the system, technical feasibility, sustainable production, improvement on soil health and economic use of water in SRI than conventional method. The study suggested for sufficient attempt for motivating farmers, team work, adequate training and exposure visit to develop confidence, skill competency in maintaining ideal field condition, assured irrigation facilities for maintaining water and custom hiring facilities for use of implements to eliminate the constraints of the farmers succeeding area expansion of SRI along with increasing production and productivity in rice cultivation.*

**Key words:** SRI, constraint, adoption, rice farmers

Rice is the staple food for nearly three billion people of the world and the demand continues to grow as population increases (Carri and Vallee, 2007). If the current estimated growth of 1.8 to 2.0 percent per year continues for the next 20 years in India, it will require about 50 percent more food. The targeted demand of rice for Indian population has been set at 121 million tons by the year 2030 (CRRI, 2013). There are several examples such as stagnated production, decrease in soil health, climate change, water scarcity etc. that makes a challenge for adoption of modern technology in rice cultivation and demand alternate options for sustainable production.

The System of Rice Intensification (SRI) method appears to be a viable alternative for rice cultivation with less water, low seed rate, more soil organic matter, more soil aeration and low dose of chemical fertilizers (Rao, 2006). The method started promoting in Asia during 1997 and Govt. of India promoted the methodology in an intensive manner. State Department of Agriculture, Govt. of Odisha is also undertaking massive programme every year for popularization of SRI through block demonstrations across the state. However, SRI is found to be difficult

for most farmers to practice as it requires additional labour and intensive care (Moser and Barrett, 2002). Besides, SRI method will not be applicable invariably elsewhere for which on-farm participatory research is required for site specific adoptions to expose farmers to SRI perspectives (Uphoff and Fernandes, 2002). Attempt was therefore made to assess the constraints of the farmers in adopting SRI method.

### MATERIALS AND METHODS

The study was undertaken in 23 districts out of 30 districts of Odisha (except Koraput, Nabarangapur, Kandhamal, Sonapur, Keonjhar, Deogarh, and Cuttack). Five farmers practicing SRI were selected randomly from different villages in each district covering the total sample size of 115 farmers. A schedule was developed referring journals and other literatures along with information collected in pilot study. The schedule was further pre-tested, modified and finalized. Data was collected with the assistance of KVK scientists from each district. Benefits of SRI, planning made by the organization, technological support, transplanting and intercultural operations as well as infrastructure support were selected as the variables for analyzing the constraints.

## RESULTS AND DISCUSSION

The system of Rice Intensification is an evolving set of practices, principles and philosophies aimed at increasing the productivity of rice by changing the management of plants, soil, water and nutrients. As observed from Table 1, majority of the respondents had expressed the benefits of higher production (95.65%), more profit (96.52%), sustainable production (91.30%), economic use of water (85.22%) compatible to the system (82.61%), technically feasible (79.13%) and improvement on soil health (67.83%) in SRI over the conventional method. It indicates that the farmers have realized the benefits of SRI.

Planning is most essential to achieve the end results. Organizing people, participatory decision making, selection of site and beneficiaries along with team effort are very much required to motivate farmers. It is observed from Table 2 that 'no efforts for team work', and 'insufficient attempt for motivating farmers' were the pertinent constraints expressed by the respondents with regard to planning made by the officials of the state department of Agriculture. In addition, they opined that staff of the department had only motive to achieve the target rather than involving farmers in all aspects of planning in a true sense.

The method of SRI is new to most of the farmers. Knowledge and skill competency of the farmers are required to accustom with the change in practices. The data in Table 3 revealed that the respondents were more or less satisfied with supply of reference materials, departmental co-operations, guidance, monitoring and supervision. However, the farmers expressed that there were rare exposure visits to the well performed demonstration plots to develop confidence among the farmers and to motivate them to adopt the changed practice and also inadequate training

programmes on SRI method to develop knowledge and skill competency in adoption of recommended practice. The constraints expressed by the respondents on these two aspects are very relevant and it is suggested for organizing adequate training programmes as well as exposure visits.

Specialised skills are required in SRI method. Early and careful transplanting of 10-12 days old seedlings, wider spacing of 25x25cms, 3-4 times weeding by cono weeder, intermittent wetting and drying up to panicle initiation and use of sufficient organics are the basic principles of SRI. It is observed from Table 4 that the respondents had not expressed much constraints in transplanting one seedling of 10-12 days old at shallow depth detaching from the mat. They also did not have much difficulty in nursery raising, carrying marker to the field and applying recommended organic manure. But they expressed severe constraints in maintaining ideal field situation and covering more area under SRI. These difficulties seem very pertinent and warrant for mechanization of SRI practices.

Various intercultural operations are required to get desired yield. As observed from Table 5 the respondents had expressed more constraints in 'maintaining water at field situations' 'erratic rainfall' and 'non-availability of assured irrigation facilities'.

However, there was a positive indication that the respondents did not find much difficulty in weeding with cono weeder which was also seen as not more costly. The respondents have to be sufficiently exposed for the water management practices which will definitely influence them to adopt SRI method.

Rice itself is a labour intensive crop. Infrastructural supports, particularly farm mechanization are essentially required for coverage of more area under SRI. As observed from Table 6, the constraint of 'no

**Table 1.** Benefits of SRI method (N=115)

Benefit	Better than conventional method		Same asconventional method	
	Frequency	% age	Frequency	% age
Higher production	110	95.65	5	4.35
More Profit	111	96.52	4	3.48
Compatible to the system	95	82.61	20	17.39
Technically feasible	91	79.13	24	30.87
Sustainable production	105	91.30	10	8.70
Improvement on soil health	78	67.83	37	32.17
Economic use of water	98	85.22	17	14.78

**Table 2.** Constraints on planning made by the organisations

Constraint	Mean score	Rank
Insufficient attempt to motivate farmers	3.04	III
No transparency in selection of beneficiaries	2.03	VIII
Not concern in selection of feasible site	2.11	VII
Not following cluster approach	2.33	IV
Not involving farmers in decision making	2.23	VI
No efforts of team work	3.07	I
Not clarifying responsibility	2.28	V
Motivate to achieve target only	3.06	II

(Maximum obtainable score-4)

**Table 3.** Constraints of the farmers on technological support

Constraint	Mean score	Rank
Inadequate training	3.19	I
No exposure visit to develop confidence	3.07	II
No supply of reference material	1.90	IV
Insufficient guidance and expertise	1.87	V
Irregular monitoring and supervision	2.20	III
Field staffs not cooperative	1.61	IV

(Maximum obtainable score-4)

**Table 4.** Constraints in transplanting

Constraint	Mean score	Rank
No skill in transplanting one seedling hill <sup>-1</sup>	2.03	VI
No skill competency in nursery raising	1.96	VII
Difficulty in transplanting at shallow depth	2.23	V
Difficulty in detaching one seedling from the mat	2.47	III
Difficulty in maintaining ideal field condition	3.10	II
Not possible to cover more area	3.19	I
Not feasible to carry marker to the field	1.72	VIII
Not possible to apply recommended organic manure	2.30	IV

(Maximum obtainable score-4)

**Table 5.** Constraints in intercultural operation

Constraint	Mean score	Rank
Not possible to maintain water in field situation	3.24	I
Erratic rainfall	3.16	III
Assured water not available for irrigation	3.26	II
Difficulty in weeding with cono weeder	1.96	VI
Number of weeding becomes costly	2.21	V
Not possible for weeding more area with cono weeder	2.32	IV

(Maximum obtainable score-4)

attempt towards custom hiring service' for use of implements and machineries in different operations was ranked first with highest mean score. It can be inferred that though the State Govt. has provided adequate subsidy for promoting purchase of implements, machineries, and developing irrigation systems etc., the farmers perhaps were not able to invest, for which they were unable to purchase farm equipments. This might be the reason for which the constraint relating to 'availability of feasible implements', 'credit support', and 'farm mechanization' etc. got less mean score. Hence, the State Deptt. of Agriculture may promote entrepreneurs for providing custom hiring service for the benefit of the large number of farmers.

Further attempt was made for a comparative analysis of all the above types of constraints. It is observed from the Table 7 that the opinion of the respondents were almost similar in all the aspects of SRI covered under the study. It is therefore ascertained that the respondents have more or less constraints in all the aspects of SRI method covered under study.

Further attempt have been made to assess the influence of socio-economic variables of the respondents inhibiting the constraints. The results obtained through co-efficient of correlation analysis reveal that (Table 8) socio-economic variables of the respondents had not much influence in minimizing constraints in SRI method. However, type of house,

**Table 6.** Constraints on infrastructural supports

Constraint	Mean score	Rank
No attempt for mechanization	1.91	V
Feasible implements not available	2.13	IV
No attempt for custom hiring facility	3.03	I
No attempt for irrigation facility	2.23	III
No credit support for purchasing implements	2.47	II

(Maximum obtainable score-4)

**Table 7.** Comparative analysis of the constraints

Constraint	Mean score	Rank
Planning	2.52	II
Technological Support	2.31	V
Transplanting	2.38	III
Intercultural Operation	2.69	I
Infrastructural support	2.35	IV

(Maximum obtainable score-4)

**Table 8.** Influence of socio-economic variables on constraints (Correlation value)

Variable	Planning	Technological support	Trans-planting	Interculture	Infrastructural Support
Age	0.170	0.007	0.353**	0.253*	0.125
Education	0.014	0.046	0.115	0.114	0.038
Caste	-0.068	-0.086	0.234*	-0.194	-0.148
Social participation	0.079	-0.079	0.002	0.051	0.101
Cosmopolitaness	0.126	0.172	0.118	0.184	0.133
Type of house	0.276**	0.288**	-0.364**	-0.182	-0.293**
Size of holding	-0.022	0.153	-0.024	0.244*	-0.152
Annual income	-0.120	-0.262**	-0.339**	-0.002	-0.325**

\*Significant at 0.05 level

\*\* Significant at 0.01 level

annual income and age of the respondents may be taken in to account while advocating farmers for SRI method, as these variables significantly affected the adoption of SRI methods by farmers.

The findings of the study conclude that the respondents had stated the benefits of higher production, more profit, compatibility to the system, technically feasibility, sustainability in production, economic use of water and improvement on soil health in SRI over the conventional method. However, sufficient attempt for motivating farmers, team work, adequate training, exposure visit to develop confidence of the farmers, skill competency in maintaining ideal field condition, assured irrigation facilities for maintaining water at field situations and custom hiring facilities for the use of implements may be extended to solve the constraints of the farmers and in succeeding large scale adoption of SRI method for increasing production and productivity

in rice cultivation.

## REFERENCES

- Anonymous 2013. Vision 2050, Pub. by ICAR-Central Rice Research Institute, Cuttack
- Carriger F and Vallee D 2007. More crop per drop, *Rice Today*, 6(2):10-13
- Moser CM and Barrett CB 2003. The disappointing adoption dynamics of a yield increasing, low internal input technology: The Case of SRI in Madagascar, In. *Agricultural Systems*, Oxford, UK 76(3) :1085-1100
- Rao Kishan 2006. System of Rice Intensification, Bulletin published by WASSAN, Secunderabad:20
- Uphoff N and Fernandes E 2002. System of Rice Intensification gains momentum, *LEISA Magazine*, India, October 2002: 22-27.