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## Study the knowledge level of farmers about SRI method of rice cultivation in Bargarh district of Odisha

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### Abstract

Rice is not everything in India, but everything in most parts of India starts and ends with rice, from birth to death. SRI uses 25-50 percent more labour than conventional rice cultivation methods in the initial stages. Once farmers master the techniques of SRI, labour requirements will be reduced by about 10 percent. It is more resistant to biotic and abiotic stress beside drought. In the present study, ex post facto research design has been followed. The study was carried out in 4 villages of Bargarh district. The villages were Turunga, Haldipali, Sayaan and Birmal of Bargarh block. Multi stage random sampling technique was followed to select the sample for the study. Total respondents were 100. Majority of famers (76%) in the study area are having medium level of knowledge regarding SRI method of rice cultivation. The study reveals that the farmers have adequate knowledge in majority of the package of practices of SRI method of rice cultivation. But in some areas viz. Using conoweeder, Knowledge on selection of varieties in different land situation., Draining water 20 days after flowering., Green manuring / brown manuring and fertilizer dose, Weed management practices etc. the SRI farmers have very poor knowledge. So the agriculture department of the district may take necessary measures for training of the SRI farmers regarding the above areas for more adoption and better management of SRI method of rice cultivation.

**Keywords:** SRI method, nursery bed raising, land preparation, water management and weed management

### Introduction

Rice is the staple food of half the world's population and 90% of it is produced and consumed in Asian subcontinent only. India has the world's largest area devoted to rice cultivation, and it is the Second largest producer of rice after China. It is lifeline that has extended into more than 540 of India's 604 districts. Rice provides 21 percent of Global human per capita energy and 15 percent of per capita protein. Rice area in India has fluctuated fairly stably around 43 million hectares during the last two decades, with a maximum rice area of 45.5 million hectares in 2008-2009.

The origin of SRI is traced to a small island country, the Madagascar, which was under the severe grip of hunger and malnutrition during the 1980s (Barah, 2009) [2]. SRI is an amalgamation of refined and intensive management practices for rice production at farmer's field. The conservation of land, water and biodiversity, and utilization of the hitherto ignored biological power of plant and solar energy, is the novelties of SRI. On account of its growing global acceptance, SRI has emerged as a movement among farmers. SRI was developed in Madagascar in the early 1980s by Father Henri de Laulanie, a Jesuit Priest, who spent over 30 years in that country working with farmers. In 1990, Association Tefy Saina (ATS) was formed as a Malagassy Non-Governmental Organisation (NGO) to promote SRI.

The System of Rice Intensification (SRI) is a set of principles and practices for increasing the productivity of irrigated rice by changing the current conventional management of lands, soil, water and nutrients. The System of Rice Intensification improves yields with less water, less seed, and less chemical inputs than most conventional methods of rice cultivation. This means that the returns on inputs are higher, making the method potentially more profitable than most of the traditional methods. SRI improves the productivity of land, labour, water and capital used in rice cultivation.

### Material and Methods

In the present study, ex post facto research design has been followed because in ex post facto research design the events have taken place (cultivation of rice by SRI method) prior to

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undertaking the research. The study was carried out in 4 villages of Bargarh district. The villages were Turunga, Haldipali, Sayaan and Birmal of Bargarh block. While selecting the villages the focus was given on extent of adoption of farmers, the knowledge and the socio-economic gain that resulted in adoption of SRI method of rice cultivation by farming farmers. Multi stage random sampling technique was followed to select the sample for the study. The District and Block were selected purposively. Then random sampling procedure was adopted to select the Panchayats, Villages and respondents for the study. Total respondents were 100. For the present investigation pre-testing of the interview schedule has been done by 10 SRI farmers who have not been included as a respondent in the final study.

## Result and Discussion

The content of a knowledge test is composed of questions called items. Items for the test were collected from different

sources, such as literature, publications on SRI method of rice cultivation, SRI scientists, Agriculture extension workers and SRI farmers. The items were collected in relation to major fields of SRI method of rice cultivation.

**Table 1:** Knowledge level of the SRI farmers.

N=100			
SL.	Level of knowledge	Frequency	Percentage
1	High knowledge on SRI (total score 21-31)	10	10
2	Medium knowledge on SRI (total score 11-20)	76	76
3	Low knowledge on SRI (total score 0-10)	14	14

From the above table 1, majority of famers (76%) in the study area are having medium level of knowledge regarding SRI method of rice cultivation.

**Table 2:** Knowledge level of farmers corresponding to different statement

N= 100				
SI No.	Statement	Correct Responses (1)	Correct knowledge F/%	No knowledge F/%
1	Selection of land-	Medium upland, medium lowland and low lands are suitable	38	62
2	Land preparation-	4-5 ploughing is required for preparing land	48	52
		6inch depth of ploughing is ensured in the last ploughing	36	64
3-	Selection of seed	Improved variety of seed	81	19
		Medium lowlands and lowlands require varieties of 150days duration	16	84
		Medium uplands require varieties of 120days duration	35	65
4	What practice you followed in preparing nursery bed-	Selecting 40 sq.mt. Area for one area crop	42	58
		Bed size 1x10 meter	51	49
		Preparing raised bed of 8-10 cm. Height	48	52
		Provide drainage channels on all sides	62	38
5	What procedure followed in raising nursery	Using 2 k.g. seeds per acre or 5kg/ha	64	36
		Sowing only sprouting seeds	75	25
		Broadcasting the sprouted seeds on the seed bed	57	43
		Covering seeds with well decomposed FYM	60	40
6	What practice followed in land preparation	Preparing well levelled fields with good drainage	51	49
		Making channels after 2-meter distance	39	61
		Marking at 25x25 cm. Distance	72	28
7	What practices followed in transplanting	Transplanting 8-12 days old seedlings	69	31
		Transplanting one seedlings per hill	75	25
		Transplanting immediately after uprooting from nursery	82	18
8	What practice followed in fertilizer management	Applying 4-5 tonnes FYM/compost per acre, Using vermi-compost	45	55
		Applying before ploughing and incorporating	85	15
		Green manuring/brown manuring	22	78
		Applying 60:30:20 kg. NPK	26	74
		Applying nitrogen in three doses	74	26
		Applying potash in two doses	42	58
9	Water management practices followed	Keeping 2-3 cm. Standing water during flowering to maturity	74	26
		Provide drainage channel to avoid submergence	72	28
		Draining water 20 days after flowering	18	82
10	Weed management practices followed	Four weeding at 10 days interval	31	69
		Using cono/mandwa weeder for weeding	52	48

### Selection of Land

The above-mentioned table signifies that the knowledge level of the farmers in selecting lands suitable for cultivating rice in SRI method was found to be 38% and 62% of people didn't have proper knowledge for selection of land.

### Land Preparation

The table above tells that the farmer's knowledge level in preparation of land by 4-5 ploughing was 48% and 52% do not have the proper knowledge. The people having knowledge on providing 6 inches of depth on ploughing were 36% and farmers with no knowledge were 64%.

### Selection of Seed

Selecting of seeds is a vital role and from the above stated table the farmers having knowledge on selection of seed on the improved variety of seed were 81% and 19% with no knowledge. The farmers having knowledge on crop cutting in 150 days duration for medium lowlands and lowlands were 16% with full knowledge and with no knowledge were 84%. The knowledge of farmers in cutting the crop in 120 days duration for medium uplands were 35% and those having no knowledge were 65%.

### Preparation of Nursery Bed

The above table shows that knowledge of farmers in preparation of nursery bed, selecting 40 sq.mt area for 1 acre crop were 42% and 58% were no knowledge. The farmers having knowledge on preparing bed size 1x10 meter were 51% and those with no knowledge were 49%. The knowledge of farmers for preparing raised bed of 8-10 cm height 48% and no knowledge were 52%. The farmers having knowledge level and providing drainage channels on all sides were 62% and 38% with no knowledge.

### Nursery Bed Raising

From the above table, we can see that the knowledge of farmers towards using 2kg seeds for cultivating 1acre crop was 64%, and 36% farmers were not having proper knowledge. The knowledge of farmers for having knowledge on sowing sprouted seedlings were 75%, and 25% of farmers were not having proper knowledge. The knowledge of farmers towards sowing and broadcasting sprouted seeds and covering seeds with well decomposed FYM were in good amount in the farmers those are 57% and 60% respectively.

### Land Preparation

As it is observed from the above table, most of the farmers were having proper knowledge on preparation of land for cultivating rice in SRI method. Knowledge for preparing well leveled and well drainage in fields was 51%. Farmers having knowledge on making channels at 2m distance were 39%, and 61% farmers were not having proper knowledge. For marking the field with 25x25cm distance, the farmers were having 72% of full knowledge and 28% farmers were having no knowledge.

### Transplanting

As observed from the above-mentioned table reveals that the knowledge of farmers having in transplanting 8-10 days old seedlings were 69% and no knowledge with 31%. The farmers having knowledge on transplanting one seedling per hill were 75%, 25% have no knowledge. Most of the farmers had well knowledge on transplanting immediately after uprooting from nursery, their knowledge levels were 82%, 18% have no knowledge.

### Fertilizer Management

The above-mentioned table shows that most of the farmers have knowledge on fertilizer management. The knowledge level of farmers on applying 4-5 tones FYM/compost per acre were 45% and no proper knowledge farmers were 55%. The farmers having knowledge on applying before ploughing and incorporating were very high in numbers i.e. 85% and no knowledge were 15%. The farmers having knowledge level on implementing green manuring/brown manuring were 22% full knowledge, 78% with no proper knowledge. The

knowledge level of farmers on applying 60:30:20 kg NPK was 26% full knowledge and 74% with no adequate knowledge. Most of the farmers were having well knowledge level on applying nitrogen in 3 doses, 74% and 26% no knowledge respectively. So as the knowledge level of farmers on applying potash in 3 doses were 42% with and 58% with no knowledge.

### Water Management

For providing Keeping 2-3 cms. Standing water during flowering to maturity knowledge the farmers were 74%, 26% were having no knowledge. For providing drainage channel to avoid submergence knowledge the farmers were 72%, 28% were having no knowledge. The knowledge of draining water 20days after flowering was of 18% and 82% of farmers were having no knowledge.

### Weed Management

As observed from the table, the farmers were having partially good knowledge about the weed management for SRI method. Using of cono/mandwaweeder for weeding was known to the farmers as 52% knew fully, and 48% was having no knowledge.

From the above findings, it is found that the majority of the SRI Farmer's have low knowledge on the following package of practices:

1. Using conoweeder
2. Knowledge on selection of varieties in different land situation.
3. Draining water 20 days after flowering.
4. Green manuring / brown manuring and fertilizer dose.
5. Weed management practices.

So, the agriculture department of the district may take necessary measures for training of the SRI farmers regarding the above areas for more adoption and better management of SRI method of rice cultivation.

### Summary and Conclusion

For knowledge test 31 items were selected with the consultation of agriculture department, agriculture extension officer, Scientists and advanced SRI farmers. The farmers were scored one for each correct answer and zero if they don't have the knowledge for that item. In this way we categories the SRI farmers into three categories i.e. high knowledge, medium knowledge and low knowledge. From the study we found that the farmers who have high knowledge are 14%, medium knowledge 76% and less knowledge are 10%.

From knowledge test we found that the farmers have adequate knowledge regarding the SRI method of rice cultivation. 81% farmer know that improved seed variety, 75% know sowing only sprouted seeds, and 74% knows that the application of nitrogen in three doses is necessary in SRI method of rice cultivation. Also, we found that the 48% don't know the use of conoweeder, 82% farmers don't know that the draining should be done in 20 days after flowering, 84% have no knowledge on selection of varieties in different land situation, 78% have no knowledge on green manuring/brown manuring and fertilizer dose and 69% don't know the weed management practices in SRI method of rice cultivation. From knowledge test we also found that some specific areas should be taken into consideration and necessary actions should be taken to train the farmers.

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