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Knowledge Level of Farmers Regarding System of Rice Intensification (SRI) Method in Puri District of Odisha

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ABSTRACT

A study was carried out to evaluate the knowledge level of farmers regarding System of Rice Intensification (SRI) method in Puri district of Odisha covering four villages viz. Kuarpur, Kashia sasan, Durgapur and Dandipur. The data were collected through personal interview by designing a questionnaire. Knowledge level was tested with 3 point scale from farmers and was analyzed by using statistical tools. Knowledge level of farmers towards land preparation, transplanting, fertilizer management, water management and weed management were at high level. Some farmers knowledge were poor which can be improved by imparting training on SRI method of rice cultivation by extension personnel of Agriculture University or State Department of Agriculture.

Keywords: *Farmer, Knowledge, Questionnaire, Sampling, System of Rice Intensification*

INTRODUCTION

Rice is the staple food of half the world's population and 90% of it is produced and consumed in the Asian subcontinent. Estimates suggest that 24-30% of the world's assessable freshwater resources (rivers, lakes, aquifers) are used to irrigate rice. By 2025, 15-20 million of the world's 79million hectares of irrigated rice low lands, which provide 3 quarters of world's rice supply, are expected to suffer some degree of water scarcity. India has the world's largest rice cultivated area and already facing a major water crisis. Demand for a water intensive crop such as rice is expected to increase by 38% by 2040, depending on the existing water crisis (IWMI, 2007).

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. SRI method helps increase yield by over 30% while using 40% less water than conventional methods.

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The method was initially developed in 1980s in Madagascar and has been validated in 43 countries. SRI practices and concepts have also been successfully adopted in upland rice and extended to other crops (Wheat and Maize) in course of time.

Although the benefits of SRI have been amply demonstrated around the world, the potential to achieve the benefits to large scale implementation of the methods has yet to be tapped. A report on more rice with less water recommends that massive rice producing countries like India, China, and Indonesia convert at least 25% of their current rice cultivation to SRI methods by 2025. This world is not only dramatically reduced the use of water for rice production but also improve global food security.

The SRI approach is very knowledge-intensive and requires careful study and continuous experimentation to find out the most effective combination of practices matching the rice plant with the growing environment, such as changing the spacing between plants, seedling age, planting depth of the seedlings, timing and methods of irrigation and drainage, as well as methods of weeding, etc. in the present context of agricultural scenario of the state, SRI method of rice cultivation have a wider scope to bridge the economic gap of Odisha. The most important aspect of (SRI) rice cultivation is the transfer of technology to explore its production potentiality. It is also necessary to motivate the farmers to accept and act upon the technology to increase farm income. As rice is the principal crop of the nation. The population explosion requires demands more food production. The area under rice is gradually decreasing over the year along with continuous crop raising without maintaining soil health and natural resources also distributed our ecosystem. After that people were adopting SRI method of rice cultivation with suitable management practices for crop plant, soil, water and nutrients (Thatchinamoorthy & Selvin, 2014). Despite all the rich profitability of the technology of the System of Rice Intensification (SRI) practices the extent of it's remain insignificant due to various reasons (Nath and Das, 2018). Keeping in view the importance the study was undertaken with the objectives to assess the knowledge level of the System of Rice Intensification (SRI) and to find out the gap analysis in Rice production.

MATERIALS AND METHODS

The study was carried out in 4 villages of Puri district. The villages were Kuarpur, Durgapur, Kashia sasan, Dandipur of Nimapara block. While selecting the villages the main focus was given on the extent of adoption of farmers, the knowledge and the socio-economic gain that resulted in the adoption of System of Rice Intensification (SRI) method of rice cultivation by farmers. A preliminary survey of the selected villages was carried out at the beginning of the following aspects. Here randomly selected of 110 respondents. A Knowledge test was developed with item related to SRI. The data were collected through personal interviews by designing a questionnaire. Knowledge level was tested with 3 point scale from farmers as full knowledge; partial knowledge and no knowledge were scored as 3, 2 and 1 respectively. The data were collected, tabulated and analyzed by using statistical tools (Samui et al., 2000). 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.

RESULTS AND DISCUSSION

In the present study, knowledge has been operationalized as the body of understood information possessed by the respondents on the cultivation of paddy under SRI method. The overall knowledge level and technology-wise knowledge level of the respondents was studied and the findings were presented in this section. The knowledge level of respondents in SRI cultivation technology was measured by using scores for SRI techniques.

The table 1. revealed that the knowledge level of the farmers in selecting lands suitable for cultivating rice in SRI method was found to be 29.1% for having full knowledge, 70.9% of farmers have partial knowledge for selecting land. The people knowing to provide irrigation facilities to the fields was 49.1% had full knowledge, 49.1% having partial knowledge and 1.8% of people didn't have proper knowledge for irrigation.

Table 1: Knowledge level of farmers towards the selection of land (N=110)

Sl. No.	Statements	FK		PK		NK	
		F	%	F	%	F	%
1	Medium upland, medium low land and lowlands are suitable	32	29.1	78	70.9	00	00
2	Irrigation facility is needed for medium uplands and medium lowlands	54	49.1	54	49.1	2	1.8

Where, **FK**- Full Knowledge, **PK**- Partial Knowledge, **NK**- No Knowledge

The table 2. revealed that the farmer's knowledge level in preparation of land by 4-5 ploughing was 98.2% who had full knowledge and 1.8% had partial knowledge. The people having knowledge on providing 6 inches of depth on ploughing were 78.2% and farmers with partial knowledge were 21.8%.

Table 2: Knowledge level of farmers towards land preparation (N=110)

Sl. NO.	Statements	FK		PK		NK	
		F	%	F	%	F	%
1	4-5 ploughing is required for preparing land	108	98.2	2	1.8	00	00
2	6 inch depth of ploughing is ensured in the last ploughing	86	78.2	24	21.8	00	00

Where, **FK**- Full Knowledge, **PK**- Partial Knowledge, **NK**- No Knowledge

On perusal of the data table 3. the farmers having knowledge on the selection of seed on the improved variety of seed were 69.1% who knew it with full knowledge, 29.1% with partial knowledge and 1.8% with no knowledge. The farmers having knowledge on crop cutting in 150 days duration for medium lowlands and lowlands were 60% with full knowledge and with partial knowledge were 40%. The knowledge of farmers in cutting the crop in 120 days duration for medium uplands has 63.6% fully knowledgeable and those having partial knowledge were 36.4%.

Table 3: Knowledge level of farmers towards the selection of seed (N=110)

Sl. No.	Statements	FK		PK		NK	
		F	%	F	%	F	%
1	Improved variety of seed	76	69.1	32	29.1	2	1.8
2	Medium lowlands and low lands required varieties of 150 days duration	66	60	44	40	00	00
3	Medium uplands required varieties of 120 days duration	70	63.6	40	36.4	00	00

Where, **FK**- Full Knowledge, **PK**- Partial Knowledge, **NK**- No Knowledge

The table 4. shows that the knowledge of farmers in preparation of nursery bed, selecting 40 sq m. area for 1 acre crop was 41.8% full knowledge and 58.2% were partially knowledgeable. The farmers having knowledge of preparing bed size 1x10 metre were 45.5% and those with partial knowledge were 54.5%. The knowledge of farmers for preparing a raised bed of 8-10 cm height 52.7% with full knowledge and of partial knowledge was 47.3%. The knowledge of farmers on putting well mixed soil and FYM of equal amount on the bed, with full knowledge was 92.7% and that with partial knowledge was 7.3%. The farmers having knowledge level for providing drainage channels on all sides were 58.2% with full knowledge and 41.8% with partial knowledge.

Table 4: Knowledge level of farmers towards the preparation of nursery bed (N=110)

Sl. No.	Statements	FK		PK		NK	
		F	%	F	%	F	%
1	Selecting 40 sqmt. Area for 1 acre crop	46	41.8	64	58.2	00	00
2	Bed size 1x10 metre	50	45.5	60	54.5	00	00
3	Preparing raised bed of 8-10 cm height	58	52.7	52	47.3	00	00
4	Putting well mixed soil and FYM of equal amount on the bed	102	92.7	8	7.3	00	00
5	Provide drainage channels on all sides	64	58.2	46	41.8	00	00

Where, **FK**- Full Knowledge, **PK**- Partial Knowledge, **NK**- No Knowledge

From table 5. depicts that the knowledge of farmers towards using 2Kg seeds for cultivating 1acre crop was 32.7% having full knowledge, 61.8% of people had partial knowledge and 5.5% farmers were not having proper knowledge. The knowledge of farmers for having full knowledge on selecting good quality seeds was 34.5%, 47.3% were having partial knowledge and 18.2% of farmers were not having proper knowledge. The knowledge of farmers towards sowing and broadcasting sprouted seeds and covering seeds with well decomposed FYM was in good amount in the farmers those are 70.9%, 72.7% and 87.3% respectively.

Table 5: Knowledge level of farmers towards raising nursery bed (N=110)

Sl. No.	Statements	FK		PK		NK	
		F	%	F	%	F	%
1	Using 2 Kg seeds per acre	36	32.7	68	61.8	6	5.5
2	Selecting good quality seeds with salt solution	38	34.5	52	47.3	20	18.2
3	Sowing only sprouting seeds	78	70.9	30	27.3	2	1.8
4	Broadcasting the sprouted seeds on the seed bed	80	72.7	28	25.5	2	1.8
5	Covering seeds with well decomposed FYM	96	87.3	14	12.7	00	00

Where, **FK**- Full Knowledge, **PK**- Partial Knowledge, **NK**- No Knowledge

From the above table 6. it is revealed that most of the farmers were having proper knowledge on the preparation of land for cultivating rice in SRI method. Knowledge for preparing well leveled and well drainage in fields was 81.8% full knowledge. 85.5% of the farmers were having full knowledge of good puddling and leveled field. Farmers having full knowledge of making channels at 2m distance were 67.3%, 27.3% people had partial knowledge

and 5.5% farmers were not having proper knowledge. For marking the field with 25x25cm distance, the farmers were having 56.4% of full knowledge and 43.6% farmers were having partial knowledge. 90.9% of the farmers from the study area were having full knowledge on not keeping standing water during transplanting.

Table 6: Knowledge level of farmers towards land preparation (N=110)

Sl. No.	Statements	FK		PK		NK	
		F	%	F	%	F	%
1	Preparing well leveled field with well drainage	90	81.8	20	18.2	00	00
2	Good puddling and leveling	94	85.5	16	14.5	00	00
3	Making channel after 2 meter distance	74	67.3	30	27.3	6	5.5
4	Marking at 25x25 cm distance	62	56.4	48	43.6	00	00
5	Not keeping standing water during transplanting	100	90.9	10	9.1	00	00

Where, **FK**- Full Knowledge, **PK**- Partial Knowledge, **NK**- No Knowledge

It is observed from table 7. that the knowledge of farmers in transplanting 8-10 days old seedlings was 58.2% with full knowledge and partially knowledge with 41.8%. Putting seedlings with a thin metal sheet of 30x30 cm, in this method the knowledge level of farmers was 27.3% full knowledge, 67.3% with partial knowledge and 5.5% with not known. The farmers knowing on transplanting 1 seedling per hill were 74.3% with full knowledge, 21.8% with partial knowledge and 3.6% with no knowledge. Most of the farmers had full knowledge of transplanting immediately after uprooting from the nursery; their knowledge levels were 81.8% full knowledge, 14.5% with partial knowledge and 3.6% with no knowledge. Most of the farmers have knowledge level on, not removing seeds from the plant while transplanting were 90.9% full knowledge, and 9.1% with partial knowledge. The knowledge of farmers on not washing the seedlings after uprooting was also in good numbers, they were 92.7% with full knowledge and 7.3% with partial knowledge.

Table 7: Knowledge level of farmers towards transplanting (N=110)

Sl. No.	Statements	FK		PK		NK	
		F	%	F	%	F	%
1	Transplanting 8-12 days old seedlings	64	58.2	46	41.8	00	00
2	Putting seedlings with a thin metal sheet of 30x30 cm	30	27.3	74	67.3	6	5.5
3	Transplanting single seedling per hill	82	74.3	24	21.8	4	3.6
4	Transplanting immediately after uprooting from nursery	90	81.8	16	14.5	4	3.6
5	Not removing seeds from the plant while transplanting	100	90.9	10	9.1	00	00
6	Not washing the seedlings after uprooting	102	92.7	8	7.3	00	00

Where, **FK**- Full Knowledge, **PK**- Partial Knowledge, **NK**- No Knowledge

The data given in table 8. shows that most of the farmers knew fertilizer management. The knowledge level of farmers on applying 4-5 tonnes FYM/compost per acre was 87.3% full knowledge and partial knowledge farmers were 12.7%. The farmers knew to apply fertilizers before ploughing and incorporating were very high in numbers i.e. 96.4% full

knowledge and partial knowledge were 3.6%. The farmers having knowledge level on imple menting green manuring/brown manuring were 32.7% full knowledge, 50.9% with partial knowledge and 16.4% with didn't know. The farmers having knowledge level on how to using vermi compost, were 27.3% full knowledge, 56.4% with partial knowledge and 16.4% with no knowledge. The knowledge level of farmers on applying 60:30:20 kg NPK was 78.2% full knowledge and 21.8% with partial knowledge. Most of the farmers were having full knowledge level on applying nitrogen in 3 doses, 92.7% full knowledge and 7.3% partial knowledge respectively. So as the knowledge level of farmers on applying potash in 3 doseswere 96.4% with full knowledge and 3.6% with partial knowledge.

Table 8: Knowledge level of farmers towards fertilizer management (N=110)

Sl. No.	Statements	FK		PK		NK	
		F	%	F	%	F	%
1	Applying 4-5 tonnes FYM/compost per acre	96	87.3	14	12.7	00	00
2	Applying before ploughing and incorporating	106	96.4	4	3.6	00	00
3	Green manuring/brown manuring	36	32.7	56	50.9	18	16.4
4	Using vermicompost	30	27.3	62	56.4	18	16.4
5	Applying 60:30:20 kg NPK	86	78.2	24	21.8	00	00
6	Applying nitrogen in 3 doses	102	92.7	8	7.3	00	00
7	Applying potash in 3 doses	106	96.4	4	3.6	00	00

Where, **FK**- Full Knowledge, **PK**- Partial Knowledge, **NK**- No Knowledge

The data in table 9. revealed that the farmers were having full knowledge on water management for SRI method. Maintaining water at soil saturation knowledge was full with 90.9% of farmers and 9.1% of farmers were having partial knowledge. For providing a drainage channel to avoid submergence, knowledge the farmers were 65.5% full knowledgeable, 34.5% were having partial knowledge. 56.4% of farmers were having full knowledge on alternate drying and wetting and 43.6% of farmers were having partial knowledge. Knowledge on providing light irrigation during hairline crack was full with 49.1% of farmers and 50.9% farmers were having partial knowledge about it. 65.5% of farmers were having the full knowledge on keeping standing water during flowering to maturity and 34.5% farmers were having partial knowledge on this. The knowledge on draining water 20 days after flowering was full with 74.5% and 25.5% of farmers were having partial knowledge.

Table 9: Knowledge level of farmers towards water management (N=110)

Sl. No.	Statements	FK		PK		NK	
		F	%	F	%	F	%
1	Maintaining water at soil saturation	100	90.9	10	9.1	00	00
2	Provide drainage channel to avoid submergence	72	65.5	38	34.5	00	00
3	Alternate drying and wetting	62	56.4	48	43.6	00	00
4	Light irrigation during hairline cracks	54	49.1	56	50.9	00	00
5	Keeping 2-3 cm standing water during flowering to maturity	72	65.5	38	34.5	00	00
6	Draining water 20 days after flowering	82	74.5	28	25.5	00	00

Where, **FK**- Full Knowledge, **PK**- Partial Knowledge, **NK**- No Knowledge

From the table 10. it is observed that the farmers were having partially good knowledge about the weed management for SRI method. The farmers were having good knowledge of irrigating the field before 1 day of weeding, i.e. 81.8% full knowledge, 14.5% partial knowledge and 3.6% didn't know. Use cono/mandwa weeder for weeding was not well known to the farmers as 29.1% knew fully, 43.6% had partial knowledge and 27.3% didn't know. The farmers having knowledge level on incorporating weeds into the soil were 61.8% full knowledge, 36.4% partial knowledge and 1.8% was not having any knowledge. The farmers knowing setting 4 weeding at 10 days interval were, fully known 60%, partial knowledge 32.7% and 7.3% didn't know. Uprooting weeds manually near to the plant, this method was known to most of the farmers so the numbers were 92.7% with full knowledge and 7.3% with no knowledge.

Table 10: Knowledge level of farmers towards weed management (N=110)

Sl. No.	Statements	FK		PK		NK	
		F	%	F	%	F	%
1	Irrigating filed before 1 day of weeding	90	81.8	16	14.5	4	3.6
2	Using cono/mandwa weeder for weeding	32	29.1	48	43.6	30	27.3
3	Incorporating weeds into the soil	68	61.8	40	36.4	2	1.8
4	4 weeding at 10 days interval	66	60	36	32.7	8	7.3
5	Uprooting weeds manually near to the plant	102	92.7	8	7.3	00	00

Where, **FK**- Full Knowledge, **PK**- Partial Knowledge, **NK**- No Knowledge

The results from table 11 revealed that caste, occupation and cosmopolite were not significantly related to the knowledge level of the respondents or these three variables had no influence in the change in knowledge level. It is revealed that education (0.307) was found to be highly significant with the knowledge level followed by the possession of farm implements (0.298), annual income (0.283), social participation (0.190), information sources (0.182), size of land holding (0.175), family type (0.121), age (0.119), and outward orientation (0.066) respectively. The technology gap observed in the study may be attributed the difference in the climate conditions, timeliness of availability of inputs and feasibility of technology demonstrated (Sagar & Chandra, 2004).

Table 11: Correlation study of socio economic variables with knowledge

Sl.No	Characters	r-value	Remark
1	Age	0.119	
2	Education	0.307	**
3	Caste	-0.156	
4	Family Type	0.121	
5	Size of land holding	0.175	
6	Occupation	-0.169	
7	Outward Orientation	0.066	
8	Information Sources	0.182	
9	Social Participation	0.190	
10	Cosmopolite	-0.120	
11	Possession of farm implements	0.298	*
12	Annual Income	0.283	*

*Correlation is significant at the 0.05 level

**Correlation is significant at the 0.01 level

CONCLUSION

It was concluded that the knowledge level of the farmers was scored higher in full knowledge about SRI method of rice cultivation. Few of the respondents had poor knowledge about SRI method. Hence some training can be imparted on the technology by the extension personnel of Agriculture University or State Department of Agriculture.

REFERENCES

IWMI. (2007). Rice: Feeding the Billions, Chapter 14, in *Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture*. Earthscan, London, and International Water Management Institute, Colombo.

Nath, D., & Das, D.K. (2018). Knowledge on SRI (System of Rice Intensification) of Farmers in Tripura, India. *Int.J.Curr. Microbiol.App.Sci. 7*(3), 3586-3592.

Sagar, R.L., & Chandra, G. (2004). Front line demonstration on sesame in West Bengal. *Agricultural Extension Review*. *16*(2), 7-10.

Samui, S.K., Maitra, S., Roy, D.K., Mandal, A.K., & Saha, D. (2000). Evaluation of front line demonstration on groundnut. *J. Indian Soc. Coastal Agri. Res. 18*(2), 180-183.

Thatchinamoorthy, C., & Selvin, S. (2014). Knowledge Level of the Farmer in System of Rice Intensification Cultivation Practices in Tirunelveli District of Tamil Nadu, India., *Indian Journal of Natural Sciences. 4*(25), 1650-1654.