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Original Research Article

Impact of SRI Training and Demonstration on Increasing Paddy Production Productivity in Dhanbad District

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A B S T R A C T

The System of Rice Intensification, widely known as SRI, is a method of rice cultivation developed by Fr. Henri de Laulanié in the early 1980s. SRI was first introduced in Tamil Nadu and spread over all India. In Jharkhand, this system was introduced in 2005 and then all the district of the state practiced this system. With introduction of the SRI in Dhanbad District the area, production and productivity of the rice in the district was increased gradually due to adoption by the farmers, In this direction the Krishi Vigyan Kendra, Dhanbad played a very vital role in training of the farmers and conducted front line demonstration on farmers field. The training on SRI started in 2008-09 and the area has been increased from 23.8 ha to 2239.88 ha and the productivity of paddy has been increased from 12.73q/ha in 2009-10 to 29.50 q/ha in 2015-16 which is very significant due to adoption of the system of rice intensification in the district

Keywords

System of Rice Intensification; Training, Front Line Demonstration, Treatment Effects; Yield

Introduction

Everything in most parts of India starts and ends with rice, from birth to death. It is an integral part of Indian culture. It is a lifeline that extends into more than 640 of India's 707 districts. India has the world's largest area devoted to rice cultivation, and it is the second largest producer of rice after China. Over half of its rice area is irrigated, contributing 75% of the total production.

The System of Rice Intensification, widely known as SRI, is a method of rice cultivation developed in an unconventional way, now known and being practiced in more than 40 countries. This wide spread in a decade's time is due to the fact that it addresses many of the challenges faced by rice farmers across the world. The SRI methodology was synthesized in the early 1980s by Fr. Henri de Laulanié. In 1999, the first such trials began in China and Indonesia, and in India the following year. SRI has been known in India since 2000.

SRI in India was introduced in 2000 in Tamil Nadu, Puducherry and Tripura and considered as a major breakthrough with reduced water use, lesser fossil fuel based inputs, increasing yields and environment friendly. The innovation is basically farmer

centric. Today SRI is gradually spreading from farmer to farmer improving productivity and profits, reducing water inputs and challenging high input driven post Green Revolution agricultural practice. About one million farmers are reported to have tested SRI in more than 350 rice growing districts in the country. SRI became part of the National Food Security Mission in 2007. Indian agriculture is witnessing a fine blending of scientific and indigenous knowledge systems in agro ecological crop management.

It is clear from the above table that the SRI was first introduced in Tamil Nadu and spread over all India. In Jharkhand, this system was introduced in 2005 and then all the district of the state practiced this system. With introduction of the SRI in Dhanbad District the area, production and productivity of the rice in the district was increased gradually due to adoption by the farmers, In this direction the Krishi Vigyan Kendra, Dhanbad played a very vital role in training of the farmers and conducted front line demonstration on farmers field. The area, production and productivity of paddy from 2000-01 is given as under.

It is clear from the above table, that the production (55455.5 metric ton) and productivity of the district was very low 1520 Kg in 2000-01. In 2005-06 the production and productivity were all time low due to lack of proper cultivation knowledge and use of traditional method of cultivation

Materials and Methods

The present study was conducted in Dhanbad district to see the impact of training and front line demonstration (FLD) conducted in increasing paddy production in the district. The training on SRI was started by Krishi Vigyan Kendra Dhanbad from 2008-09 and still continues. The Front Line Demonstration were started from 2012-13 and continue till2015-16. The impact of training and demonstration on increase in production and productivity were tremendous and played significant role in increasing production and productivity of the district.

Results and Discussion

From the above table, it is clear that, Krishi Vigyan Kendra, Dhanbad initially started training programme from 2008-09 at on campus and off campus and organized 21 with a total participation of 452 trainees and 15 farmers adopted SRI in 23.8 hectare. In 2010-11, 13 training programme were organized in which 1087 farmers has been trained. From 2012-13 to 2014-15 total 24 training were organized in which 651 farmers were trained. In 2015-16 total 13 training programmes were organized in which 575 farmers were trained at campus as well as off campus. The adoption after training was gradually increased from 15 farmers in 2008-09 to 2578 farmers in 2015-16. As per area is concern, the area under SRI cultivation were only 23.8 hectare in 2008-09 and gradually increased up to the 2239.88 hectare in 2015-16. The area under paddy cultivation is about 39500 ha, which varies year to year depending on the weather condition. The area under SRI has also been increasing gradually year by the year from 23.8ha, to 2239.88ha, in 2015-16 with few constraints in adoption of this method. In 2016-17 the area were further increased up to 2786.53 hectare with increase in number of person adopted system of rice intensification.

It is clear from the above table, the area, production and productivity has been increased subsequent years. In the area of

rice were only 21,211 ha. which was increased 41,576 ha. in 2016-17 with a production from 27,001.61 quintal to 1,22,649.00 quintal. The productivity has also been increased from 12.73 quintal/ha. in 2009-10 to 29.50 q/ha. The production and productivity has been declined in 2015-16 due to drought in 2015-16.

Table-4, the major personal characteristics like age, education and land holdings of the trainees trained in SRI cultivation by the Krishi Vigyan Kendra, Dhanbad are taken for adoption. The majority of the farmers who were participated in training belongs to the age group between 31 to 50 years followed by the age group of below 31 years age. The participation of the farmers belongs to age group of above 50 years were less from 2008-09 to 2015-16. As per education is concern, majority of the participants in the training programme were belongs to graduate and above and 10-12 standard of education. The participation of farmers having education up to 8 standards was less.

The average size of land holding of the farmers who were participated and adopted having 2.0 to 5.0 ha land followed by large 5.0 to 10ha. The participation of small size land holding farmers was less because they were not eager to take risk in case of failures. Therefore, it is clear from the table that, majority of the participants who were trained and adopted belongs to the age group between 31-50 years, posses 10-12 years of education and having 2.0-5.0 ha of land to adopt SRI in their field.

Table.1 Timeline in Introduction of SRI in different parts of India

S. N	Year	State	Introduced by
1	2000	Tamil Nadu Tripura Puduchery	Tamil Nadu Agricultural University; Ramasamy Selvam (organic farmer) Dept.of Agriculture Auroville Farm
2	2001	Karnataka	Narayana Reddy, organic farmer
3	2202	Bihar	Rajendra Agricultural University
4	2003	Andhra Pradesh West Bengal	Acharya N.G.Ranga Agricultural University; WASSAN PRADAN
5	2004	Kerala Andaman Odisha Punjab Haryana Assam Gujarat	Mitraniketan KVK Central Agricultural Research Institute Central Rice Research Institute ATMA/Dept. of Agriculture POSTER (NGO); Tilda Rice Co. Ltd. Assam Agricultural University Anand Agricultural University
6	2005	Chhattisgarh Maharashtra Uttarakhand Meghalaya Jharkhand	Indira Gandhi Krishi Vishwa Vidyalaya Dr. Balasaheb Sawant Konkan KrishiVidyapeeth G.B. Pant University of Agriculture & Technology. ICAR Research Complex for NE region Birsa Agricultural University
7	2006	Himachal Pradesh Jammu & Kashmir Nagaland	Peoples' Science Institute Sher-E-Kashmir University of Agricultural Sciences & Technology 'Prodigals Home'

Table.2 Production and Productivity of Paddy before SRI Training and demonstration

Year	Area (Ha)	Production (Metric Ton)	Productivity (Kg/ha)
2000-01	63,000	55455.5	1520
2001-02	63,000	90615.5	1925
2002-03	60,000	40574.45	1595
2003-04	40851	93691.28	2375
2004-05	36822	59100.83	1704
2005-06	44154	43166.47	970
2006-07	45164	119853.07	2718
2007-08	50123	127143.21	2749

Source- District Agriculture office, Dhanbad

Table.3 Year wise Training organized, Number of participant trained to Increase in adoption and area

Year	No. of training organized	No. of Farmers trained	No. of person adopted SRI	Area in (ha)
2008-09	21	452	15	23.8
2009-10	15	316	39	39.57
2010-11	13	1087	54	61.62
2011-12	10	397	109	72.23
2012-13	8	145	186	489.19
2013-14	9	230	897	2022.3
2014-15	7	276	1581	2018.
2015-16	13	575	2578	2239.88
2016-17	8	378	2958	2786.53

Table.4 Year wise Increase in Area, Production and Productivity of Paddy

Year	Area (in ha.)	Production (in Quintal)	Productivity (Qt/ha)
2009-10	21,211	27,001.61	12.73
2010-11	18,665	24,077.85	12.90
2011-12	53,530	1,86,018.62	34.78
2012-13	37,835	96,668.00	25.55
2013-14	29,709	71,895.00	24.20
2014-15	26,127	1,18,656.00	45.38
2015-16	37,235	41,629.00	11.18
2016-17	41,576	1,22,649.00	29.50

Source: District Agriculture Office, Dhanbad

Table.5 Personal Characteristics of the SRI trainees

Year	No. of Farmers trained	Average Age (in percentage)			Education (in percentage)			Land Holdings (in percentage)		
		Below 30 years	Between 31 to 50 years	More than 50 years	Up to 8	Between 10-12	Graduate and above	Up to 1.0 ha	2.0-5.0 ha	5.0-10ha
2008-09	452	23	61	16	25	38	37	31	36	33
2009-10	316	25	56	19	21	36	43	27	39	34
2010-11	1087	26	59	15	23	43	34	22	41	37
2011-12	397	21	63	16	19	41	40	19	38	43
2012-13	145	19	64	17	27	36	37	28	39	33
2013-14	230	24	61	15	21	37	42	26	41	33
2014-15	276	26	56	18	25	39	36	32	38	30
2015-16	575	22	59	19	18	37	45	27	41	32
2016-17	378	25	54	21	23	48	29	32	43	25

Table.6 Year wise Performance of Front Line Demonstration on System of Rice Intensification

Year	**Thematic Area**	**Name of the technology demonstrated**	**No. of Farmers**	**Area (ha)**	**Yield (q/ha)**		**% Increase**	***Economics of demonstration (Rs./ha)**				***Economics of check (Rs./ha)**			
					Demo	**Check**		**Gross Cost**	**Gross Return**	**Net Return**	** **BCR**	**Gross Cost**	**Gross Return**	**Net Return**	** **BCR**
2012-13	Crop Production	Variety – Navin sprayed with plant protection measures	25	12	40	32	25.0	18000	43200	25200	1:2.4	18000	34560	16560	1:1.92
2013-14	Crop Production	Variety Navin sprayed with plant protection measures	32	20	46	35.5	29.5	20500	52900	32400	1:2.6	19500	40825	213255	1:2.09
2014-15	Crop Production	Variety MTU-7029 sprayed with plant protection measures	63	20	56.68	32.4	74.9	23000	68000	45000	1:2.9	19000	39000	20000	1:2.1
2015-16	Crop Production	Variety MTU-1010 sprayed with plant protection measures	63	20	59.5	37.8	49.5	25500	83895	58395	1:2.29	24500	53298	28798	1:2.17

*Economics to be worked out based total cost of production per unit area and not on critical inputs alone.

Table-5 shows the effect of front line demonstration (FLD) conducted on SRI cultivation by the Krishi Vigyan Kendra on adoption and in increasing productivity of the paddy in the district. The Front line demonstration has been started (after successful on farm trial (OFT) conducted in 2010-11) from 2012-13 and still continued till 2015-16. In 2012-13, FLD were conducted in 25 farmers field and the result shows that, the demonstration yield was 40quital/ha as compared to 32 q/ha hectare in check i.e. 25 per cent in increase in the yield. The benefit cost ratio was also higher 1:2.4 in demonstration field as compared to check 1: 1.92. During 2013-14, FLD were conducted in 32 farmers of the district and the results shows that the demonstration yield was 46q/ha as compared to 35.5 q/ha which is 29.5 per cent higher than check yield. The gross and net returns were also higher than traditional method. The benefit cost ratio of the demonstrated field was 1:2.6 as compared to traditional one (1:2.09).

In 2015-16 the severely drought hit the district and the paddy production was fall sharply during the year. But FLD during 2014-15 were conducted in 63 farmer field and the performance of the demonstration fields was very good, the yield of the demonstrated field was reported 56.68q/ha as compared to local check field i.e. increases in 74.9%. The gross and net return also higher in demonstration field. The benefit cost ratio was 1:2.9 was high in demonstration field as compared to the local check (1:2.21). The FLD during 2015-16 were conducted in 63 farmers of the district and the results shows an increase in the yield by 49.5% over local check i.e. the yield of demonstrated field reported 59.5 q/ha as compared to 37.8 q/ha farmers condition. The benefit cost ratio was also found better 1:2.29 in demonstrated field as compared to local check 1:2.17. The gross and net returns also reported higher in all the years since start of the front line demonstration

The result of the study shows that training and front line demonstration conducted by the Krishi Vigyan Kendra on System of Rice Intensification play very vital role in boosting paddy productivity in the district. The adoption of SRI has been increased from 15 farmers in 2008-09 to 2958 in 2016-17. The area, production and productivity of the paddy has been increased significantly despite of few constraints like timely unavailability of cono weeder for weeding, marker for marking spacing. If more efforts were made to popularize the System of Rice Intensification among the farmers, the production and productivity of the district further can be increased manifolds.

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