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SYSTEM OF RICE INTENSIFICATION TECHNOLOGY : AN ANALYSIS OF CONSTRAINTS PERCEIVED BY THE FARMERS IN ADOPTION OF SRI TECHNOLOGY

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Abstract

The success of any innovation depends upon the availability of technological inputs and other required resources. An attempt has been made to know the problems faced by the farmers in the adoption of System of Rice Intensification Technology and collect their suggestions to minimize their problems. The present study was conducted in ten villages of Kurud block in the Dhamtari district of Chhattisgarh, India. A total of 126 selected farmers were treated as respondents. The study revealed that among several constraints, shortage of agriculture labour (93.65%) was the major constraint in adoption of SRI technology, followed by 67.46 per cent of the respondents faced non availability of cono-weeder and marker non availability of farm yard manure (FYM), 36.50 per cent of them faced labour demanded high labour cost, 34.12 per cent of them faced sometimes seedling died in early stage, 30.15 per cent of respondents faced more infestation of weed due to wider spacing and sometimes seedling died in early stage and the respondents (61.11%) suggested that the trained labour should be available on low wage and the amount of subsidies on seed and fertilizers should be increased, 57.93 per cent of the respondents suggested that government should provide cono-weeder and marker, 47.61 per cent of them suggested that the price of hybrid rice should be low, 34.12 per cent of the respondents suggested that government should provided more knowledge about high yielding varieties, 23.80 per cent of the respondents suggested that government should provide subsidies on bio-fertilizers, 21.42 per cent of the respondents suggested that the transplanter should available on low price will be helpful in the adoption of SRI technology.

Key words : SRI technology, adoption, problems and suggestions.

Introduction

India is second largest producer of rice after china and has an area of over 45.5 million hectares (Thiyagarajan and Gujja, 2013) and production 105.31 million tonnes with productivity 2393 kg ha^{-1} (Anonymous, 2013a). Rice is the water intensive crop. More than 70 per cent of the country's ground and surface water is being used for agriculture and out of this, 70 per cent is allocated to rice cultivation. Each kg of rice produced with irrigation requires 3000-5000 litres of water. Various water-saving rice production systems have been developed so far *e.g.* aerobic rice culture, ground-cover rice production system, raised beds, alternate wetting and drying etc (Farooq *et al*., 2009). System of Rice Intensification (SRI) is one of them. SRI technology is a civil society innovation occurred outside the formal research system that was first developed accidentally in Madagascar by Father Henri de Laulanié, in 1980, who combined field observations of rice plant performance with a series of experiments over a decade (Laulanié, 1993). SRI technology involves the transplanting of young seedlings, one per hill instead of a clump of several seedlings and 8-12 days old instead of the usual 3-4 weeks; very carefully but quickly, taking special care to protect the young roots; with wider spacing and in a square pattern to give both roots and canopy more room to grow, for taking up nutrients and capturing sunlight; maintaining the soil in mostly aerobic condition, not suffocating the plant roots or beneficial soil organisms; controlling weeds with a simple mechanical hand weeder that also actively aerates the soil; and enhancing the soil organic matter as much as possible with compost or mulch to 'feed the soil' so that the life within it will help feed and protect the growing plants. The story SRI

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technology in India indicates the complex evolution process of innovation and development. Today, India has one of the largest numbers of SRI farmers in the world. Official record indicates that SRI diffused first to Tamil Nadu State, followed by Andhra Pradesh in India (Prasad, 2006). However, there is a need to study how SRI was diffused and adopted across the States of Tamil Nadu and Andhra Pradesh (Krishnan, 2008). In Chhattisgarh, the area under SRI technology in 2010-11 was 1317 hectares. In the year 2011-12, the area under SRI technology was 20,000 hectares. The average yield through SRI technology was recorded 5313 kg ha^{-1} (www.Cgagri.net). The area under SRI technology in current year (2013) in Kurud block is 400 hectares. (www.Cgagri.net). Keeping this in view, an attempt has been made to know the socio-personal and socio-economic characteristics of farmers and their impact on SRI technology adoption.

Materials and Methods

Location of the study

The study was conducted during the year 2012-13 in the Dhamtari district of the Chhattisgarh State. The Chhattisgarh State consists of 27 districts, out of which Dhamtari district was selected because productivity of rice is quite high and majority of rice area is under assured irrigation. Out of total 4 blocks namely; Dhamtari, Kurud, Magarlod and Nagari; only Kurud block was selected purposively because maximum numbers of farmers who are adopting SRI technology in the district are residing in this block. For this study, a list of villages was prepared, where SRI technology was more popular in the block with the help of Department of Agriculture Government of Chhattisgarh. Thereafter, 10 villages for this study were (Chaarbhata, Gudhgudha, Banagar, Loharpathara, Naari, Rampur, Joratarai, Kamrodh, Korra and Hanchalpur) selected on the basis of maximum area under SRI technology. In this way, the 10 villages were selected for the study.

Method of data collection

From the list of each village, 20 per cent SRI technology adopters were selected randomly for collection of data. In this way (10 × 20% from each village = 126) a total of 126 SRI technology adopters were selected for present study. The respondents were selected from Kurud block by the help of proportionate random sampling procedure. Ex Post-facto research design was followed in this study. The data were collected with the help of well structured and pre-tested and well structured interview schedule.

Results and Discussion

Constraints faced by the SRI adopters in adoption of recommended practices of SRI technology

The constraints as perceived by SRI adopters in adoption of recommended practices of SRI technology are given in table 1. Among several constraints, shortage of agriculture labour (93.65%) was the major constraint in adoption of SRI technology, followed by 67.46 per cent of the respondents faced non availability of cono-weeder and marker non availability of farm yard manure (FYM), 36.50 per cent of them faced labour demanded high labour cost, 34.12 per cent of them faced sometimes seedling died in early stage, 30.15 per cent of respondents faced more infestation of weed due to wider spacing and sometimes seedling died in early stage, 27.77 per cent of them faced lack of awareness about suitable variety, 9.52 per cent of them faced difficulty in pulling cono-weeder, difficulty in marking field for transplanting seedlings, 6.34 per cent of respondents faced agricultural labour not willing to transplant single seedling, 5.55 per cent of respondents faced difficulty in preparation of raised seed bed, 4.76 per cent of the respondents faced risk in low of chemical, non-availability of seeds and fertilizers timely and hybrid seed is costly, 3.96 per cent of them faced psychological fear of loss, 2.38 per cent of them faced more infestation of weed and difficulty in maintenance of field, 1.58 per cent of them faced seedling decayed in heavy rainfall and only 0.79 per cent of the respondents faced performance of available variety seeds good. Kiran and Shenoy (2010) also found similar constraints in adoption of SRI in Warangal district of Andhra Pradesh, India.

Suggestions given by the respondents to overcome the constraints faced by the SRI adopters

As regards to suggestions given by the respondents to overcome the constraints in adoption of SRI technology the findings are presented in the table 2. The data reveal that the majority of the respondents (61.11%) suggested that the trained labour should be available on low wage and the amount of subsidies on seed and fertilizers should be increased, 57.93 per cent of the respondents suggested that government should provide cono-weeder and marker, 47.61 per cent of them suggested that the price of hybrid rice should be low, 34.12 per cent of the respondents suggested that government should provided more knowledge about high yielding varieties, 23.80 per cent of the respondents suggested that government should provide subsidies on bio-fertilizers, 21.42 per cent of the respondents suggested that the transplanter should available on low price, 12.69 per cent of the respondents suggested that the weedicides and pesticides should be

Table 1: Constraints expressed by the SRI adopters in adoption of SRI method of rice cultivation. (n = 126)

S. no.	Problems expressed	Frequency*	Percentage	Rank
1.	Shortage of agricultural labour	118	93.65	**I**
2.	Non - availability of cono-weeder & marker	85	67.46	II
3.	Non–availability of farm yard manure (FYM)	46	36.50	III
4.	Agricultural labour demanded high labour cost	43	34.12	IV
5.	Sometimes seedling died in early stage	38	30.15	V
6.	More infestation of weed due to wider spacing	38	30.15	V
7.	Lack of awareness about suitable variety	35	27.77	VI
8.	Difficulty in pulling cono-weeder	12	09.52	VII
9.	Difficulty in marking field for transplanting seedlings	12	09.52	VII
10.	Agricultural labour not willing to transplanting single seedling	08	06.34	VIII
11.	Difficulty in preparation of raised seed bed	07	05.55	IX
12.	Risk in low use of chemical	06	04.76	X
13.	Non-availability of seeds and fertilizers timely	06	04.76	X
14.	Hybrid seed is costly	06	04.76	X
15.	Psychological fear of loss	05	03.96	XI
16.	More infestation of stem borer	03	02.38	XII
17.	Difficulty faced in maintenance of field	03	02.38	XII
18.	Seedling decayed in heavy rainfall	02	01.58	XIII
19.	Performance of available variety are not good	01	0.79	XIV

*Data are based on multiple responses.

Table 2 : Distribution of respondents regarding suggestions given to overcome the constraints. (n = 126)

S. no.	Suggestions	Frequency*	Percentage	Rank
1	Trained labour should be available on low wage cost	77	61.11	**I**
2	The amount of subsidies on seed and fertilizers should be increased	77	61.11	II
3	Government should provide cono-weeder & marker	73	57.93	III
4	The price of hybrid rice seeds should be low	60	47.61	IV
5	Government should provide more knowledge about high yielding varieties	43	34.12	V
6	Government provide subsidies on bio-fertilizers	30	23.80	VI
7	Transplanter should be available on low price	27	21.42	VII
8	Weedicides & pesticides should be available on low price	16	12.69	VIII
9	Government should organize farmer's fair at village level	12	09.52	IX
10	Government should provide knowledge about seedling management	11	08.74	X
11	Timely availability of seeds & fertilizers should be maintained	03	02.38	XI
12	Stem borer resistant variety should be available	03	02.38	XII
13	Extension workers should visit one's in week	01	0.79	XIII

*Data are based on multiple responses.

available on low price, 9.52 per cent of the respondents suggested that Government should organize farmer's fair at village level, 8.74 per cent of the respondents suggested that government should provide knowledge about seedling management, 2.38 per cent of the respondents suggested that the timely availability of seeds and fertilizers should be maintained and Stem borer resistant variety should be available and 0.79 per cent of them suggested that the extension workers should visit one's in week.

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