Constraints and Socio-Economic Viability among Direct Seeded Rice growing Farmers of Haryana

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Abstract

Rice, the staple food of more than half of the population of the world, is an important target to provide food security and livelihoods for millions. Imminent water crisis, water-demanding nature of traditionally cultivated rice and climbing labour costs ramble the search for alternative management methods to increase water productivity, system sustainability and profitability. Direct seeded rice (DSR) technique is becoming popular now a day because of its low-input demanding nature. It offers a very exciting opportunity to improve water and environmental sustainability. It involves sowing pre-germinated seeds into a puddled soil surface (wet seeding), standing water (water seeding) or dry seeding into a prepared seedbed (dry seeding). However, weed and nematode infestation are major problems, which can cause large yield losses in DSR. Other associated problems with DSR are increased incidences of blast disease crop lodging impaired kernel quality, increased panicle sterility and stagnant yields across the years. Based on the existing evidence, the present paper highlights the socio-economic impact of DSR, and problems associated with DSR. The study was conducted in Kurukshetra district of Haryana state. From this district, two blocks namely Thanesar and Pehowa were selected randomly.The data presented that constraints regarding marketing, technical guidance, financial constraints and miscellaneous constraints perceived by respondents were lack of marketing facilities in village, non-availability of extension officials for technical guidance, hesitation in investing money on DSR cultivation, depression is felt due to paddy appearance of direct seeded rice is not good in the first two months, ranked first constraint, respectively.

Key words: Direct seeded rice, marketing facilities, socio-economic impact, constraints

Introduction

Rice, the staple food of more than half of the population of the world, is an important objective to provide food security and livelihoods for millions. Imminent water crisis, water-demanding nature of traditionally cultivated rice and climbing labour costs ramble the search for alternative management methods to increase water productivity, system sustainability and profitability. Direct seeding has been advocated as an alternative to transplanting as it allows more rapidly land preparation and saves approximately 20 percent of labor cost and 30 percent of water cost during crop establishment (Lee et al. 2002; Swiss Agency for Development and Cooperation (SDC 2008). Direct seeding of rice is gaining popularity among farmers in Asia in response to these productivity constraints (Johnson et al. 2003). Labor scarcity has also led to the spread of direct seeding in India (Hobbs et al. 2002,Balasubramanian and Hill (2002) emphasized that, despite the reductions in labor and associated costs for crop establishment, however, other technologies are essential to overcoming constraints such as lodging of the mature rice crop imposed by direct seeding.

Direct seeded rice (DSR) technique is becoming popular now a days because of its low-input demanding nature. It offers a very exciting opportunity to improve water and environmental sustainability. According to Pandey and Velasco (2005), l ow wages and adequate availability of water favor transplanting, whereas high wages and low water availability favor DSR. The development of short duration, early-maturing cultivars and efficient nutrient management techniques along with increased adoption of integrated weed management methods haveencouraged many farmers to switch from transplanted to DSR culture. This technology is highly mechanized in some developed nations like U.S, Europe and Australia. This shift should substantially reduce crop water requirements and emission of greenhouse gases. The reduced emission of these gases helps in climate change adaptation and mitigation, enhanced nutrient relations, organic matter turnovers, carbon sequestration and also provides the opportunity of crop intensification. However, weed and nematode infestation are major problems, which can cause large yield losses in DSR. Other associated problems with DSR are increased incidences of blast diseasecrop lodging impaired kernel quality, increased panicle sterilityand stagnant yields across the years.Based on the existing evidence, the present paper highlights the socio-economic

impact of DSR, and problems associated with DSR, and suggest likely future patterns of changes in rice cultivation.

Methodology

The study was conducted in Kurukshetra district of Haryana state. From this district, two blocks namely Thanesar and Pehowa were selected randomly. Further, Amin, Alampur, Bachgaon, Dodakheri, Balani, Bir Amin, Issargarh, GhamoorKheeri, JivenKheri, Jyotisar, Kamoda, Kisangarh, Lukhi, Muthana, Ghararsi, Barana, Mirjapur, Pindarasi, Sirsana and Umri villages were selected from Thanesar block. Talhari, Chandanheri, Ishaq, Bilochpura, MeghaMajra, JurasiKalan, Shahpur, Sainsa, SainaSaida, Malikpur, Karan Shahab, Gumthala, Thana, Neemwala and Kakrali villages were selected from Pehowa block. Hundred rice direct seeded rice growing farmers were selected. Interview Schedule was prepared as per objectives of the study. Farmers were surveyed with the help of Interview Schedule. The data thus, collected were computed, tabulated and analyzed using frequency, percentage, mean score, and rank.

Results

Constraints related to technical guidance perceived by farmers

Regarding the constraints related to technical guidance (Table 1) 54 percent of the respondents opinioned a serious problem related to non-availability of extension officials for technical guidance(rank I) with highest weighted mean score (2.37), followed by 'Lack of guidance about recommended doses of new weedicides and their application techniques' which ranked second with weighted mean score 2.21, 'lack of knowledge of current advances in direct-seeded rice cultivation technology' as third major constraint with weighted mean score 2.20, whereas 'lack of guidance for proper sowing time' ranked fourth with weighted mean score (2.18), 'lack of guidance for controlling insect-pests & diseases and application of pesticides and fungicides' ranked fifth with weighted mean score (1.98) Fig. 1. The causes of lower yield in Wet- and Dry-DSR reported by researchers in different production zones may include (1) uneven or poor CE, (2) inadequate weed control (Johnson and Mortimer, 2005; Gathala et al., 2011).(3) Higher spikelet sterility than in puddled transplanting 2007; Chauhan et al. 2010).(4) Higher crop lodging, especially in wet seeding and broadcasting (Fukai, 2002, Ganwar, 2008). (5) Insufficient knowledge of water and nutrient management (Heaps 2010; Yadvinder- Singh et al., 2008; Sudhir-Yadav et al. 2011a, Bazaya 2009). Herbicide-resistant rice technologies offer

Table 1: Constraints related to technical guidance perceived by DSR farmers (n=100)

S. No.	Technical guidance constraints	Constraints			Total weighted score	Weighted mean score	Rank order
		Very serious (3)	Serious (2)	Not so serious (1)			
1.	Lack of guidance for proper sowing time	37	44	19	218	2.18	IV
2.	Lack of guidance for controlling insect-pests & diseases and application of pesticides and fungicides	31	36	33	198	1.98	V
3.	Non-availability of extension officials for technical guidance	54	29	17	237	2.37	I
4.	Lack of guidance about recommended doses of new weedicides and their application techniques	43	35	22	221	2.21	II
5.	Lack of knowledge of current advances in direct-seeded rice cultivation technology	48	24	28	220	2.20	III

opportunities for selective control of weedy rice but the risk of gene flow from herbicide-resistant rice to weedy rice poses a constraint for the long-term utility of this technology (Kumar et al., 2008a).

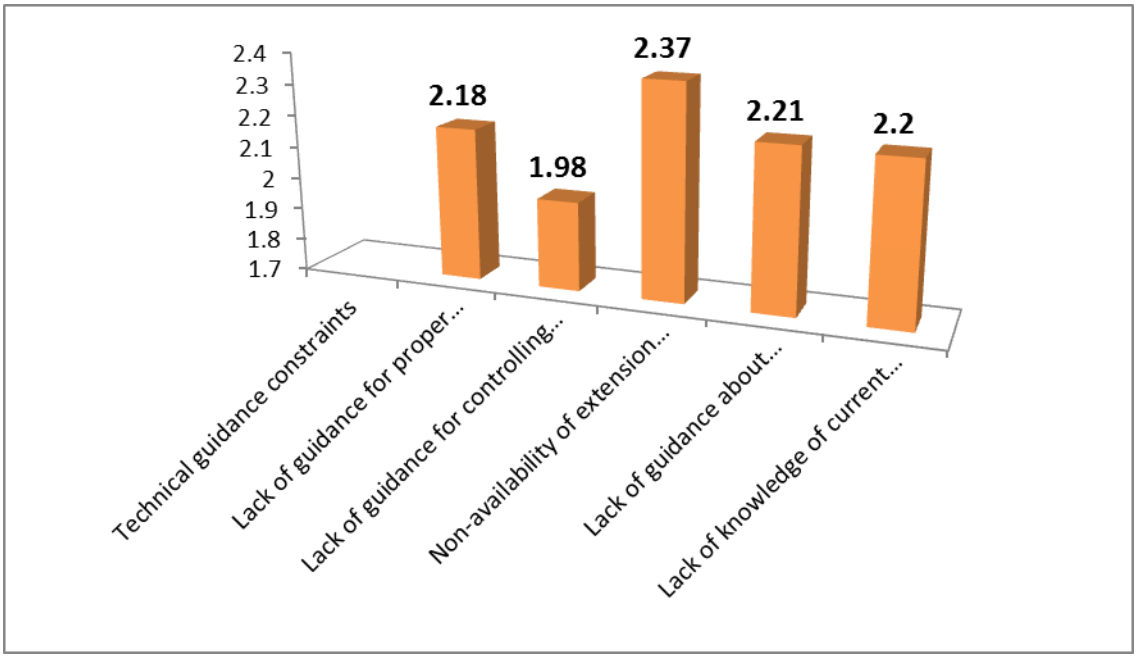

Fig. 1: Constraints related to technical guidance perceived by farmers

Financial constraints perceived by farmers

Regarding the financial constraints (Table 2) perceived by DSR growing farmers 63% consider it very serious constraint and feel hesitation in investing money on DSR cultivation (ranked I with highest weighted mean score (2.59) followed by 'higher cost of farm machinery' and 'inadequate funds to buy seed drill, power sprayers, harvester and other farm implements' were ranked second and third constraints with weighted mean score 2.34, 1.65 respectively fig.

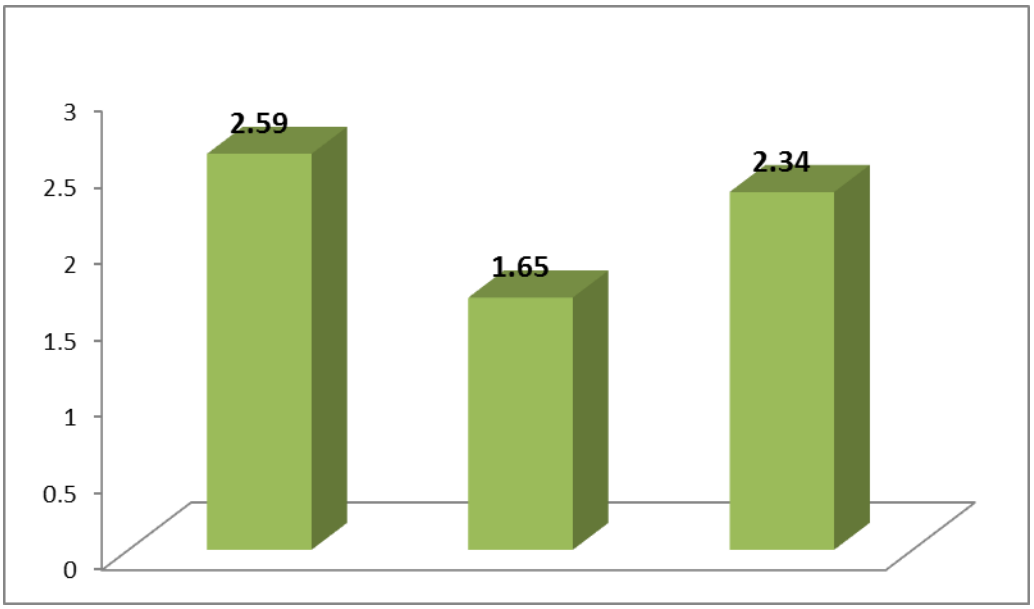

Fig.2: Financial constraints perceived by farmers

Table 2: Financial constraints perceived by DSR farmers

(n=100)

S. No.	Financial constraints	Constraints			Total weighted score	Weighted mean score	Rank order
		Very serious (3)	Serious (2)	Not so serious (1)			
1.	Hesitation in investing money on DSR cultivation	63	33	4	259	2.59	I
2.	Inadequate funds to buy seed drill, power sprayers, harvester and other farm implements	24	17	59	165	1.65	III
3.	Higher cost of farm machinery	57	20	23	234	2.34	II

Miscellaneous constraints

The data (Table 3) regarding perception about miscellaneous constraints perceived by farmers reveals that depression is felt due to paddy appearance of direct seeded rice is not good in the first two months, ranked first with highest weighted mean score (2.09) followed by Poor knowledge about using cyber communication source and no knowledge about Radio/T.V. programs related to DSR cultivation technology were ranked second and third with weighted mean score 2.07 and 1.97 respectively fig. 3.

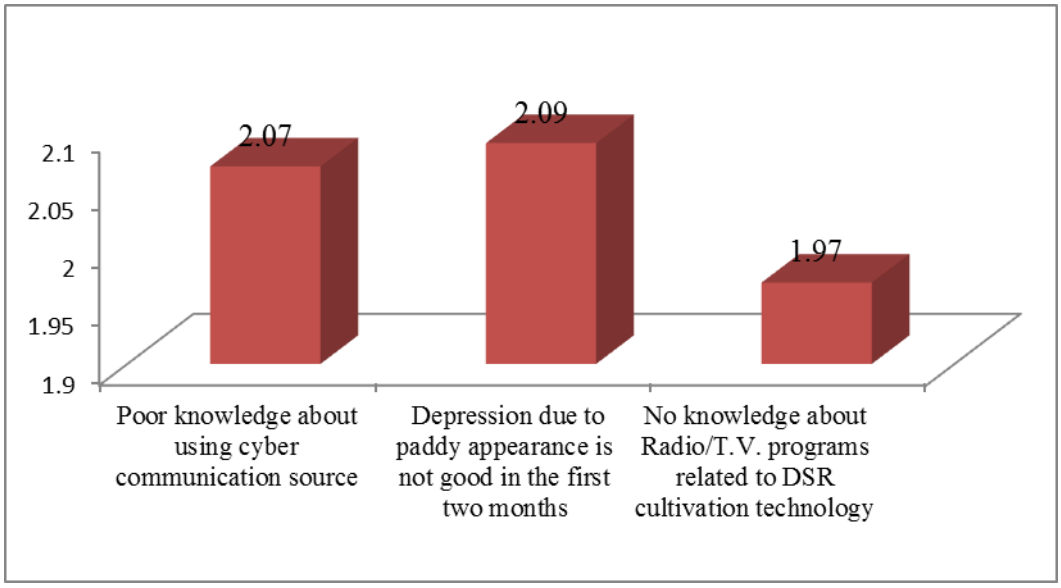

Fig. 3: Miscellaneous constraints

Table 3: Miscellaneous constraints perceived by DSR farmers

(n=100)

S. No.	Miscellaneous constraints	Constraints			Total weighted score	Weighted mean score	Rank order
		Very serious (3)	Serious (2)	Not so serious (1)			
1.	Poor knowledge about using cyber communication source	41	27	32	207	2.07	II
2.	Depression due to paddy appearance is not good in the first two months	45	19	36	209	2.09	I
3.	No knowledge about Radio/T.V. programs related to DSR cultivation technology	36	25	39	197	1.97	III

Socio-economic impact of direct seeded rice method among farmers

Multiple socio-economic effects of direct seeded rice method were perceived by the farmers like about three-fourth of the farmers reported increased in socio-economic status (76%), expenditure on education of the children and increase in household assets facilities (73% each). About two-third of the respondents reported increase in expenditure on social ceremonies (66%), social mobility (61%), increase in urban contacts (55%) mass media exposure and change

Table 4: Socio-economic impact of Direct seeded rice method among farmers

(n=100)

S.N.	Socio-economic impact	DSR growers		
		Increase (%)	Decrease (%)	No change (%)
1.	Expenditure on social ceremonies	66	10	24
2.	Expenditure on education of the children	73	07	20
3.	Mass media exposure	54	15	31
4.	Urban contacts	55	9	36
5.	Extension contacts	33	14	53
6.	Quality of health services availed	41	9	50
7.	Increased household assets	73	-	27
8.	Social mobility pattern	61	5	34
9.	Number and quality of dresses	4	8	50
10	Expenditure on variety and quality food	31	20	49
11.	Change in socio-economic status	76	10	14
12.	Average cost of cultivation/ hac under DSR method	17	71	12
13.	Saving of water under DSR	88	-	12
14.	Use of modern agricultural machinery	61	13	26
15.	Time saving and devoted on various social activities	70	13	34
16.	Labour cost	11	67	22

in family type (54% each) while 50% of the DSR adopters reported no change in quality of health services availed and in number and quality of dresses increased. Overwhelming majority

regarding economic effects of direct seeded rice method reported saving of water (88%) with DSR than conventional transplanted rice method. In general 20-30% of water saving was reported by DSR adopters. Time saving and devotion on various other agricultural activities was reported by 70% of the farmers (Table 4).

It was concluded that majority of the farmers reported increase in socio-economic status, expenditure on education of their children and increase in household assets facilities etc. Regarding production, marketing, financial, technical guidance, input, and miscellaneous constraints in direct seeded rice method farmers reported very serious constraints like high weed infestation, lack of marketing facilities in village, hesitation in investing money in DSR method, non-availability of extension officials for technical guidance, high cost of seed and depression due to paddy appearance is not good in first two months etc. So there is a need to impart training to farmer to overcome the DSR method constraints.

Recommendation:

- Farmers lack sufficient understanding of direct seeding. Training should also be imparted to farmers to adopt direct seeded method..
- Training should also provide to integrated weed management
- Development of new rice varieties for direct seeding along with proper management practices can help in adoption of DSR.

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