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Research Article

KNOWLEDGE AND ADOPTION OF FARM WOMEN FOR IMPROVED PADDY CULTIVATION PRACTICES

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ABSTRACT

Keeping in the mind the role of external factors affecting knowledge and adoption behavior of the rural farmers, a study was conducted in kurukshetra district of Haryana to assess the extent of knowledge and adoption level of farm women for improved paddy cultivation practices. Four villages were at random two blocks of kurukshetra district and a total of 160 respondents were selected purposively for the study. Twenty five practices of improved paddy cultivation were subdivided into five major aspects of paddy cultivation viz., pre-production, Production, Plant protection, Post harvesting and marketing. Semi structured interview schedule was used to collect the data, using personal interview. Majority of the respondents had higher knowledge and adoption about pre-production 4.61 and 4.56 respectively. Low level of knowledge and adoption was found about marketing practices in paddy cultivation. The age of the respondents, family size and livestock ownership were positively correlated with women knowledge and family type, family size and farm assets were correlated with women adoption in paddy cultivation practices.

INTRODUCTION

Rice is one of the world's main staple crops with nearly 2.5 billion people having their main staple food. Rice farming is also a major source of employment, especially, for the poor and about four-fifth of the world's rice production is grown by small scale farmers in low income developing countries. India has the largest paddy output in the world and is also the fourth largest exporter of rice. (https://en.wikipedia.org/wiki/Paddy_field)

As agriculture is a dominating factor in Indian economy, so a lot of technology have been developed in this field and diffused to the farmers to increase the agriculture production. Therefore, educating rural women about modern techniques in agriculture, animal husbandry and allied field can go a long way in enhancing their knowledge and skill and ultimately, the productivity of the system and farm incomes. All over the world, rural women have contributed an important role in both rice production and rice post harvest activities. Tasks related to rice planting, weeding, harvesting, and processing are the main domain of women. Overall women's involvement in rice farming varies from region to region and even within the regions women's contribution to agriculture whether it be, subsistence farming or commercial agriculture when measured in terms of the number of tasks performed and time spent is greater than men. Women perform wide spectrum of duties in running of farm, family and livestock and constitute about 55 percent to the total agricultural labour and 60 percent of the labour engaged in livestock. (Bala *et al*. 2006). In India women carry out as much as 80% of the work in paddy production (Singh *et al*., 2004; Singh and Tiwari, 2009; Chayal and Dhaka, 2010).

It is evident that the women are playing a dominant role in paddy cultivation. Achieving self sufficiency in rice production price stability are important objectives in low-income countries. To achieve this goal one important factor is to make farmers knowledgeable about improved rice farming techniques.

In this context this study was undertaken with the following objective:

1. To assess the extent of knowledge and adoption of farm women for improved paddy cultivation practices
2. To find out the factors affecting farm women's knowledge and adoption of improved practices

MATERIALS AND METHODS

The study was undertaken in Kurukshetra district which had high productivity of rice of Haryana, selected purposively. Two blocks from Kurukshetra district were randomly selected i.e. Thanesar and Ladwa block. Two villages from each block were selected at random. The villages selected from Thanesar block were Jyotiser, Bhorsaida and villages Mehrabakali and

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Badarpur from Ladwa block. Purposive selection of 40 women farmers from small land holding categories from each village growing rice along with animal husbandry and thus a total of 160 farm women rice-growers were selected as the sample for the study. The data were collected with the help of a pre-tested and validated interview schedule. Frequencies, percentage, knowledge mean score and adoption mean score were multiplied with the corresponding score value allotted to each category of the scale. . The respondents were asked to reply on each of the component comprised of several knowledge and adoption indicating question related to the practices. The responses of the respondents were obtained under dichotomized categories Yes / No. Thus, the scores assigned to the responses were one and zero respectively. The aggregate scores of each respondent for various component of the practice were computed to workout of overall knowledge and adoption scores for various messages.

$$\text{Knowledge mean score} = \frac{\text{Obtained score}}{\text{Maximum possible obtainable score}}$$

$$\text{Adoption mean score} = \frac{\text{Obtained score}}{\text{Maximum possible obtainable score}}$$

RESULTS AND DISCUSSION

Knowledge level of farm women for improved paddy cultivation practices

Knowledge is defined as the person range of information and theoretical or practical understanding. In the present study knowledge was operationlised as the extent to which and understood information possessed by the respondents about the recommended improved practices of paddy cultivation and animal husbandry in the study area.

25 agricultural practices of paddy cultivation practices were divided in five sub groups: pre production, production, plant protection, post harvesting and marketing. Perusal of the Table 1 revealed that maximum knowledge was found about recommended cultivars for the area, importance of puddling, recommended seed rate for transplanting, awareness of green manuring in paddy, recommended space for transplanting, necessary to clean the paddy before milling, drying importance, traditional storage method followed by seed treatment method and selection of good seed material (95.00%), market rate of paddy (86.25%), required nursery area for raising seedling (65.63%) and modern method of storage (62.50%).

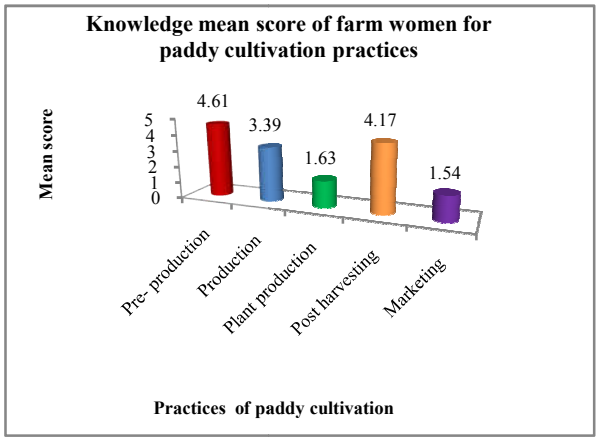

Fig. 1

The poorest extent of knowledge was reported about recommended control measure for pest and disease, disease name, weedicides necessary for weed control and quantity of NPK and FYM. The similar findings were reported by Vaishya and Nigam (2010). They reported selection of variety was first (78.00%) followed by storage (67.99%) and poor knowledge was reported for use of weedicides (3.00%), disease control (5.00%) and disease name (6.00%).

Table 1 Knowledge level of farm women for improved paddy cultivation practices N=160

Sr. No.	Practices	Knowledge Statement	Frequency	Percentage	Knowledge mean score
		Cultivars recommended for the area	160	100.00	
		Importance of puddling	160	100.00	
1.	Pre-production	Required nursery area for raising seedling for 1 ha	105	65.63	
		Seed treatment method & selection of good seed materials	152	95.00	4.61
		Seed rate recommended for transplanting	160	100.00	
		Awareness of green manuring in paddy	160	100.00	
		Recommended space for transplanting	160	100.00	
2.	Production	Quantity of NPK and FYM	62	38.75	
		Awareness about biofertilizers in paddy cultivation	-	-	3.39
		Micro –nutrient requirement	-	-	
		Weedicides necessary for weed control	40	25.00	
		Ideal time to apply weedicide	148	92.50	
3.	Plant protection	Recommended control measures for pests in paddy	11	6.88	
		Control measures for major diseases	61	38.13	1.63
		Quantity of chemicals used	-	-	
		Cleaning of paddy before milling	160	100.00	
		Importance of drying	160	100.00	
4.	Post harvesting	Post harvesting method of paddy	87	54.37	
		Two traditional storage method	160	100.00	4.17
		Two modern storage method	100	62.50	
		The market trends before selling	49	30.63	
		Awareness of the quantity of HRR (head rice recovery)	-	-	
5.	Marketing	Two major markets in Haryana	-	-	
		Market rate of paddy /quintal	138	86.25	1.54
		Market rate of rice /quintal	60	37.50	

Rizwana and Paris (2009) and Singh *et al.* (2013) have also reported the similar pattern for extent of knowledge about different practices of rice production.

On the basis of knowledge mean score majority of respondents had higher knowledge about pre-production (4.61) followed by post harvesting (4.17) and production (3.39). The poor knowledge of respondents among all the practices was found about plant protection (1.63) and marketing (1.54).

Knowledge of improved farm implements in paddy cultivation

The results in the Table 2 revealed that majority of the respondents (98.13%) were aware of sprayers followed by paddy reaper (93.13%), paddy thresher (81.88%), transplanter (63.13%), rotary weeder (13.75%) and conoweeder (13.75%).

Table 2 Knowledge of improved farm implements in paddy cultivation N=160

Sr. No.	Tools And Machines	Frequency	Percentage	Mean	Rank
1	Rotary weeder	32	30.19	0.20	V
2	Conoweeder	22	13.75	0.13	VI
3	Transplanter	101	63.13	0.63	IV
4	Sprayer	157	98.13	0.98	I
5	Paddy reaper	149	93.12	0.93	II
6	Paddy thresher	131	81.88	0.82	III

Adoption level of farm women for improved paddy cultivation practices

Adoption has been operationalized as the new practice learned by the respondents and adopted practically.
Adoption statements were also divided in six types of practices, which were pre-production, production, plant protection, post harvesting and marketing.

Data revealed in Table 13 that cent percents of the respondents used cultivars recommended for the area, practice puddling in the field and used recommended seed rate for transplanting.

Most of the respondents (94.38%) had followed seed treatment methods and selection of good seed materials followed by area grown for seedling (61.88%).

In production practices, maximum adoption was found in practicing green manuring (100.00%), recommended space for transplanting (100.00%) followed by recommended quantity of NPK and FYM (55.63%). There was no utilization of bio-fertilizers and micro-nutrients in paddy cultivation.

Under plant protection, cent percent adoption was found in use of weedicides. Majority of the respondents (80.63%) adopted the control measure to control the disease in paddy followed by more than half of the respondents (58.75%) who applied weedicides as per recommendation.

All the respondents clean paddy before milling and dry before bagging. Majority of the respondents (73.75%) had followed the traditional method of storage and 26.25 % follow modern storage method.

Most of the respondents (88.13%) sell their crop as rates prevailing in the market while 11.87 percent respondents sell when rates were at the maximum. Nearly fifty percent of the respondents (46.25%) studied the market rates before selling. Only 13.75%respondents sell their paddy at the major markets in Haryana. Not even a single respondent was aware of Head Rice Recovery.

On the basis of overall mean scores, majority of the respondents had higher level of adoption in pre-production, post harvesting and production. Proper selection of varieties of rice, importance of puddling by women respondents might be due to the fact that the study area has been adopted by respective Krishi Vigyan Kendra. Moreover, the farm women of Kurukshetra district were progressive farmers.

Table 3 Adoption level of farm women of improved paddy cultivation practices N=160

Sr. No.	Practices	Adoption Statements	Frequency	Percentage	Adoption Mean score
1.	Pre-production	Used cultivars recommended for the area	160	100.00	4.56
		Practice puddling in their field	160	100.00	
		Area grown for seedling	99	61.88	
		Followed Seed treatment methods and selection of good seed materials	151	94.38	
		Used recommended seed rate for transplanting	160	100.00	
2.	Production	Practice green manuring crop	160	100.00	2.56
		Followed the recommended space for transplanting	160	100.00	
		Used the recommended quantity of NPK and FYM	89	55.63	
		Used biofertilizers in paddy cultivation	-	-	
		Apply recommended micro –nutrients	-	-	
3.	Plant protection	Used Weedicides	160	100.00	2.39
		Apply the weedicide as per recommendation	94	58.75	
		Control measures taken for the pests	-	-	
		Used recommended quantity of chemicals	-	-	
		Control measures for the diseases in paddy	129	80.63	
4.	Post harvesting	Clean the paddy before milling	160	100.00	3.88
		Dry the paddy before bagging	160	100.00	
		Follow post harvest processing of produce	86	53.75	
		Follow the traditional storage method	118	73.75	
		Follow the modern storage method	42	26.25	
5.	Marketing	Study the market trends before selling	74	46.25	1.60
		Checking of right HRR	-	-	
		Selling paddy at the major markets in Haryana	22	13.75	
		Selling as per rates prevailing in the market	141	88.13	
		Selling paddy when rates at the maximum	19	11.87	

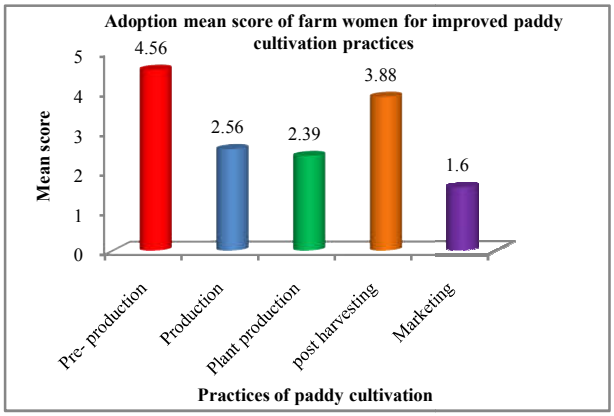

Fig. 2

The adoption of post harvest practices of paddy might be attributed to the fact that these operations were female dominated and where women could directly implement their knowledge, showed immediate and comparatively higher magnitude of adoption. The results were is close agreement with Bala *et al.* (2006). Application of weedicides as per recommendation, control measures to control pest and diseases was not adopted by majority of the respondents. In production, women respondents did not give preference for the use of bio-fertilizers and recommended micro-nutrients. This might due to the unawareness of the respondents about these two aspects. The similar findings were reported by Singh and Varshney (2010).

Adoption of improved farm implements in paddy cultivation

The results in the Table 2 revealed that less than one fourth of the respondents were aware about conoweeder and rotatry weeder but there were no adoption of these two machines in paddy cultivation. They had seen these machines in television only. Maximum adoption was found of sprayer followed by transplanter (46.88%), paddy reaper (46.25%) and paddy thresher (41.88%). Less adoption of paddy reaper and paddy thresher were found due to less land holding and in case of transplanter, it was less adopted due to the poor service of that machine.

Table 3 Adoption of improved farm implements in paddy cultivation N=160

Sr. No.	Tools And Machines	Frequency	Percentage	Mean	Rank
1	Rotary weeder	-	-	-	-
2	Conoweeder	-	-	-	-
3	Transplanter	75	46.88	0.47	II
4	Sprayer	139	86.88	0.87	I
5	Paddy reaper	74	46.25	0.46	III
6	Paddy thresher	67	41.88	0.42	IV

Factors affecting farm women's knowledge and adoption of improved practices

In order to find out the relationship between socio-personal and economic variables with knowledge and adoption of the respondents Pearson product correlation coefficient was applied. The data pertains to these aspect have been presented in the following tables.

Correlation between women's independent variables and their knowledge for improved paddy cultivation practices

Table 4 Correlation between women's independent variables and their knowledge for improved paddy cultivation practices

Sr. No.	Variables	r value
1.	Age	0.200*
2.	Caste	-0.309*
3.	Education	-0.256*
4.	Family type	0.137
5.	Family size	0.279*
6.	Land holding	-0.045
7.	Family occupation	0.023
8.	Farm assets	-0.125
9.	Family income	-0.065
10.	Livestock ownership	0.224*

*Significant at 5% level

Table 4 indicated that Caste and education were found significantly but negatively correlated with women knowledge in paddy cultivation. This may be attributed to fact that who belongs to lower caste, having low education had more involvement in paddy cultivation and resulted in high level of knowledge in paddy cultivation. Age, family size and livestock ownership were found positively significant at 5 % level of significance. Respondents who had large size of family and large livestock ownership were having more knowledge in paddy cultivation.

Correlation between women's independent variables and their adoption for improved paddy cultivation practices

Table 5 Correlation between women's independent variables and their adoption for improved paddy cultivation practices

Sr. No.	Variables	r value
1.	Age	0.155
2.	Caste	-0.085
3.	Education	-0.187*
4.	Family type	0.173*
5.	Family size	0.172*
6.	Land holding	0.136
7.	Family occupation	-0.060
8.	Farm assets	0.178*
9.	Family income	0.066
10.	Livestock ownership	0.119

*Significant at 5% level

Result regarding relationship of adoption of practices of paddy cultivation with independent variables showed that variables viz., family type, family size and farm assets were found significantly correlated with women adoption in paddy cultivation. Respondents who had joint, large size of family and large number of farm assets had high adoption of technologies in paddy cultivation. On the other hand, education was found negatively significantly correlated. Respondents who had low education level had more participation in paddy cultivation.

CONCLUSION

On the whole study it can be concluded that majority of respondents had higher knowledge about pre-production (4.61) followed by post harvesting (4.17) and production (3.39). Low level of knowledge of rural women was found in plant protection (1.63) and marketing (1.54). Majority of the respondents (98.13%) were aware of sprayer followed by

paddy reaper (93.13%), paddy thresher (81.88%), transplanter (63.13%), rotary weeder (13.75%) and conoweeder (13.75%).Majority of the respondents had higher level of adoption in pre-production (4.56) and post harvesting (3.88), followed by medium in production (2.56), plant protection (2.39) and low in pest control (1.60). Age, family size and livestock ownership were positively correlated with women knowledge and family type, family size and farm assets were correlated with women adoption in paddy cultivation practices.

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