Adoption Level and Constraints in Rice Production Technology

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ABSTRACT

The yield level of rice which is comparatively low at present need to be increased substantially. Higher rice production can be achieved by adoption of all the recommended technologies by large number of farmers. Adoption of rice production technology was studied during 2006-07 at Jabalpur district of Madhya Pradesh. Majority of the respondents (44%) studied were found to be medium level adopters. Adoption of correct dosage of fertilizers and manures as also the recommended variety was the highest (75 and 65% resp.) followed by seed treatment with fungicides (61%), plant protection (53%) and weedicide application (52%). The least adoption was for recommended nursery practices and plant population (8%, and 4% resp.). Majority of the farmers showed medium level of overall adoption of recommended technology. Weedicide application, pest and disease management in nursery maintaining plant population in main field were not adopted by the majority of the farmers. 'Non availability of high yielding varieties', High cost of labour' 'Lack of conviction in the new technology' and 'Weak extension activities at the village level were the major constraints faced by the farmers.

Key word: *Adoption; Constraints; Rice Production Technology;*

Rice is the most important and extensively grown food crop in India and it is the staple food for more than half of the world population. In India, M.P. ranks 10th in terms of area, 15th in production and 20th in productivity (2006). The scope for expanding rice production lies in enhancing productivity. Several studies have indicated that the adoption of recommended rice technology gives high yields and income to the farmers. The yield level of rice which is comparatively low at present need to be increased substantially. Higher rice production can be achieved by adoption of all the recommended technologies by large number of farmers. In general, recommended rice technologies are not accepted by all the farmers at a time and also to full extent. In this context the study was conducted with the objective to ascertain adoption level of recommended rice technologies by the farmers, find out the relationship between socio-personal and psychological traits and adoption of rice production technologies and to delineate the constraints experienced by the farmers.

METHODOLOGY

The study was conducted during 2006-07 at Khamaria, Algorah, Deori, Mahgawa and Tagar villages of Jabalpur district in Madhya Pradesh. A sample of 120 rice growing farmers was drawn using proportionate random sampling technique. Based on the judges opinion, thirteen recommended rice technologies were selected for studying level of adoption by the farmers. Personal interviews were conducted using a pre tested structured interview schedule.

RESULTS AND DISCUSSION

Adoption of Recommended rice technologies: Majority of the respondents (44.17 per cent) were found to be medium adopters, followed by low (37.50 per cent) and high (18.33 per cent) adopters (Table 1). Farmers with more economic resources alone could adopt more production technologies. It may be due to the different constraints faced by the small size holding respondents. A majority of the respondents (65.00%) adopted the recommended varieties in their cultivation. In case of 54.17 per cent of the respondents, seed rate was adopted as per the recommendation. Some of the respondents were not willing to take risk while raising their own nursery and the possibility of loss of seedlings during germination due to heavy rain, pest and disease attack. Only 40.83 per cent of respondents had adopted the

recommended nursery practice in their cultivation. Most of the respondents expressed that they could not afford to take risk due to poor germination of own seeds, pest and disease and root snapping problem during pulling of seedling.

Table 1. Distribution of respondents according to the overall adoption of recommended rice production technologies (N=120)

Adoption Level	N	%age
Low	45	37.50
Medium	53	44.17
High	22	18.33

Table 2. Adoption of recommended rice production technologies.(N=120)

Recommended technologies	N	%age
Varieties	78	65.00
Seed rate	65	54.17
Nursery area	49	40.83
Seed treatment with fungicides	73	60.83
Weedicide application in nursery	10	8.33
Manuring in nursery	52	35.00
Pest disease management in nursery	29	24.17
Age of seedling	70	58.33
Plant population	5	04.17
Weedicide application in main field	62	52.00
Organic manure application	87	72.50
Fertilizer application	94	78.33
Plant Protection measures	64	53.00

Seed treatment with fungicides was adopted by 60.83 per cent of the respondents as per the recommendations. The non-adopters were either not convinced of the practice or due to non-availability of fungicides and high cost of labour at the village level had not adopted this practice. Almost all the respondents (91.67 per cent) were non-adopters of the recommendations on weedicide application in nursery. They believed that the application of weedicide might result in scorching of young seedlings.

Recommended manuring in nursery was adopted by one third of the respondents. Most of the respondents believed that the application of manuring in nursery leads to non-availability of required quantity in time. Higher cost of labour was also cited as a reason for non-adoption of this practice. Majority of the respondents (75.83%) did not use the recommended chemicals for pest and disease control in rice nursery due to lack of skill in identifying pest and diseases, high cost of labour, high cost of inputs and non availability of trained labour Half (58.33%) of the respondents adopted the recommended age of seedling.

In case of recommended plant population, only 4.17 per cent of respondents adopted the recommended numbers of seedlings per square meter. The reason was that most of the farmers were not prepared to take risk and also were of the view that excess number of seedling get higher yield. Weedicide application in the main field was adopted by 52 per cent of respondents. Lack of conviction of the practice, non-availability of trained labour and high cost of inputs contributed to moderate adoption of this practice.

Table 3. Multiple regression coefficients of socio-personal and psychological traits.

S. No.	Socio-personal & Psychological traits	Regression Coefficient	t-value
1.	Age	- 0.050	- 0.96
2.	Education	0.970**	7.22
3.	Social participation	- 0.019	- 0.28
4.	Land holding	0.599**	2.93
5.	Family size	- 0.220	- 0.32
6.	Farm Power	0.067	0.86
7.	Material Possession	0.023	0.27
8.	Social-Economic Status	0.054	0.48
9.	Mass Media Exposure	0.046	0.65
10.	Extension Contact	0.112	1.58
11.	Economic Motivation	0.150	2.11
12.	Scientific Orientation	- 0.083	- 0.88
13.	Risk Preference	- 0.085	- 0.99

* Significant at 0.05 level of probability

**Significant at 0.01 level of probability

R2 = 0.686

Manure and fertilizer application was adopted as per the recommendation by 72.50 per cent of the respondents. It included right dosage of organic manure like farm yard manure or green leaf. With regard to recommended dosage of fertilizer application, 78.33 per cent of the respondents adopted the recommended dosage. Plant protection measures in main field were adopted by little more than half of the respondents. (53%).

Personal characteristics and level of adoption: Results revealed (Table 3) that 13 independent variables taken together explained the variation to the extent of 68.60 percent. It indicated that these variables were contributing to the adoption of rice production technology by 68.60 percent. The remaining 31.40 percent of the variation may be due to other variables which were not included in the study. The t-test of the significance indicated that coefficient of regression were highly significantly for education (B=0.9709) and land holding (B=0.5992) and significant for economic motivation (B=0.1504). So it can be predicted that one unit change in the independent variable of education, land holding and economic motivation leads to corresponding change of 0.9709, 0.5992 and 0.1504 in adoption level of rice production technology. Other variable like farm power, material possession, extension contact, socio-economic status and mass-media exposure were non significant and exerted positive influence on the adoption level of rice production technology. Variables like age, social participation, family size, scientific orientation and risk preference were negatively contributing to the adoption of rice production technology. The first two variables related to the education and land holding of the farmers while the third economic motivation was completely psychological. Hence, it was very important for extension workers to manipulate these variable in a manner so that farmers could be able to increase their adoption level of improved rice production technology. Similar findings were reported by *Sheriff (2006)* who found that 12 independent variable contributing 57 percent to the adoption of rice production technology.

Constraints in adoption: Non-availability of suitable high yielding varieties was the most important constraint reported by 63.33 per cent of the respondents. High yielding variety seeds were reportedly not available in time in local markets and Block level agricultural office. Besides these were also not available in adequate quantity to fulfill their needs. The cost was very high due to high production cost and non-availability of subsidy.

Occurrence of heavy weed growth ranked as the second important constraint by 51 per cent of the respondents. Weed growth was considered as one of the main factors responsible for declining rice yield in these areas. In addition, lack of knowledge, non-availability of weed control chemicals and equipment, high cost of inputs, lack of trained labour were the main reason for non-adoption of recommended weed management technologies. Heavy pest and disease incidence was an important constraint mentioned by 40 per cent of the respondents. Some of the respondents faced heavy damage due to rice bug, stem borer, brown plant hopper, blast and sheath blight in their crop.

High cost of the high yielding variety seeds was expressed as a constraint by 45.33 per cent of the respondents. Most of the respondents reported that they were not having enough quantity of seeds for future use. It was also found that high yielding variety seeds produced and marketed by the State Government and other agencies were priced higher due to high production cost. Complexity of view practices was ranked as the fourth important constraint by 41.67 per cent of the respondents. Most of the respondents thought that the adoption of new practices required specialized skills and knowledge, new implements and more labour.

Table 4. Constraints faced by the farmers in adoption of rice production technologies (N=120)

Constraints	N	%age	Rank
Bio-physical constraints			
Non-availability of suitable high yielding varieties	76	63.33	I
High cost of HYV seeds	54	45.33	III
Complexity of new practices	50	41.67	IV
Heavy weed growth	61	51.00	II
Pest and disease incidence	48	40.00	V
Socio-economic constraints			
High cost of inputs	72	60.00	II
High cost of labour	87	72.50	I
Non-availability of trained labour	65	54.17	III
Non-availability of credit facilities	21	17.50	VI
Lack of subsidy for inputs	56	46.67	V
Lack of support price	61	50.83	IV
Technological constraints			
Lack of awareness of technologies	26	21.67	III
Lack of conviction	42	35.00	I
Non-availability of desired technology	37	30.83	II
Institutional constraint			
Weak extension at village level	71	59.17	I
Unawareness of supplies and services offered by the Government	64	53.33	II
Insufficient training programmes	48	40.00	IV
Lack of proper communication	36	30.00	V
Lack of regulated market	53	44.17	III
Lack of transport facilities	35	29.17	VI

High cost of labour was expressed as a constraint by 72.50 per cent of the respondents as the agricultural laboures were demanding higher wages irrespective of nature of work. Non-availability of trained labour in time was also considered as a constraint by 54.17 per cent of the respondents. Most of the respondents reported that the available farm labourers were not properly

trained since most of the cultivation practices in rice farming right from sowing to post harvest require special skills.

High cost of inputs as a constraint was expressed by 60.00 per cent of the respondents. In addition sometimes due to shortage of input, the traders were selling their inputs at high cost. *Veeraswamy et al. (2003)* reported similar constraints perceived by the rice farmers of Cuttack and Puri districts of Orissa. Lack of reasonable support price was reported by 50.83 per cent of the respondents. Lack of subsidy for inputs was seen as a problem by 46.67 per cent of the respondents. Inputs were distributed at subsidised rates mostly to small and marginal farmers. Some of the respondents expressed that the subsidy amount given by the State and Central Governments was very low compared to the actual sale price of various inputs recommended.

Lack of conviction in new technology was expressed by 35.00 per cent of the respondents. Most of the respondents were not convinced about the merits of some of the costly rice technologies and did not adopt them as they were unsure of proportionate increase in production.

Non-availability of desired technology was seen as a constraint by 30.83 per cent of the respondents in rice cultivation. The recommended rice technologies may not be suitable to all the regions. The recommendations of State Department of Agriculture for obtaining higher yields may not be relevant to the village level conditions. As a result, there is a possibility for reduction of yield at farm level due to various climatic and soil factors. Lack of awareness and knowledge about certain technologies was the response given by 21.67 per cent of the respondents with regards to adoption of recommended rice technologies in their farm.

Weak extension activities at village level were reported by 59.17 per cent of the respondents and lack of information supply and services offered by the State and Central Governments was the institutional constraint expressed by 53.33 per cent of the respondents. The respondents reported that the personnel of the State Department of Agriculture were not taking adequate efforts to crate awareness among various sections of the respondents regarding benefits given by the government to boost agricultural production at farm level.

Lack of regulated market as a constraint was expressed by 44.17 per cent of the respondents. The entire farming community in the study area depended on private traders for the purchase of the agricultural inputs and for selling their produce. Due to the absence of regulated market at village level, farmers sell their produce to middle men and get lower price for their produce. Insufficient training programmes reported by 40.00 per cent of the respondents caused misunderstanding on actual potential and utility of the recommended practices.

Lack of proper communication system was reported as a constraint by 30.00 per cent of the respondents. Due to the inadequacy of agricultural programmes on radio and television, print publications, farm and home visit etc., the respondents were not aware of yield gap and how to eliminate it. Lack of transport facilities was reported by 29.17 per cent of the respondents. A large number of farmers who live in interior places spend more money on transport to reach depots for the purchase of inputs and sale of harvested produce.

CONCLUSION

Majority of the farmers showed medium level of overall adoption of recommended technology. Weedicide application, pest and disease management in nursery and main field, maintaining plant population in main field were not adopted by the majority of the farmers. 'Non availability of high yielding varieties', High cost of labour' 'Lack of conviction in the new technology' and 'Weak extension activities at the village level were the major constraints faced by the farmers. Therefore, it was necessary to intensify the extension efforts to increase their knowledge level and adoption of recommended rice technologies, which would help in increasing the yield of rice at farm level.

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