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Constraints faced by the paddy growers in adoption of plant protection measures

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Abstract

Paddy is the principal food crop of Gadchiroli district and plant protection is an important component of sustaining crop productivity. The present study was undertaken in Gadchiroli district of Maharashtra. An exploratory research design was used. The study covered 120 paddy growers selected from 12 villages from three talukas of Gadchiroli district, i.e., Gadchiroli, Desaiganj and Armori talukas. Primary data were collected through personal interviews using a pre-tested structured interview schedule and analysed using frequency and percentage. The profile findings showed that 48.33 per cent of respondents belonged to the middle-age group, 38.33 per cent had secondary school education, 47.50 per cent possessed small landholdings and 37.50 per cent combined agriculture with labour work. Further, 44.17 per cent had a medium annual income of ₹2,00,001–₹4,00,000 and 47.50 per cent cultivated paddy on 1.01–2.00 ha. A substantial majority (54.17%) had more than 20 years of experience in paddy cultivation. Regarding constraints, high cost of pesticides and spraying equipment ranked first. The findings indicate that the economic limitations and gaps in training and technical support are important barriers to adoption. Strengthening village-level training, demonstrations, timely extension advisories and access to affordable plant protection inputs may improve adoption among paddy growers.

Keywords: Paddy growers, plant protection, adoption, constraints, extension services, Gadchiroli

1. Introduction

Paddy (*Oryza sativa* L.) is one of the most important cereal crops and plays a central role in food security and rural livelihoods (Kumar *et al.*, 2020) [5]. In Maharashtra, paddy cultivation is particularly important in eastern Vidarbha, including Gadchiroli district. The district is characterized by predominantly rainfed agriculture and paddy cultivation forms an important component of the local farming system. Paddy production is affected by several insect pests and diseases. Important insect pests include stem borer, leaf folder, plant hopper, gall midge and armyworm, while important diseases include blast, neck blast, sheath blight, false smut, rice bunt and sheath rot (Savary *et al.*, 2019) [9]. Effective plant protection is therefore essential for maintaining crop yield and maintaining the economic returns obtained from other agricultural inputs. However, the availability of a recommendation does not necessarily ensure its adoption. Farmers may possess knowledge about pests and diseases but may not implement recommended measures because of economic, technical, informational and institutional constraints (Rahman, 2012; Sharma, 2019) [7, 10]. However, a gap may exist between farmers' awareness of recommended plant protection measures and their actual adoption in the field. Earlier research has also indicated that

education, farm characteristics, information sources, training and other socio-economic factors can influence the adoption of agricultural technologies. Therefore, the present study was undertaken to assess the profile of paddy growers and their constraints in adoption of recommended plant protection measures.

2. Objectives

1. To study the profile of paddy growers
2. To study the constraints faced by paddy growers in adoption of recommended plant protection measures.

3. Methodology

An exploratory research design of social research was used for the present investigation. The study was conducted in Gadchiroli district of the Vidarbha region of Maharashtra. Gadchiroli, Desaiganj and Armori talukas were purposively selected. Four villages from each selected taluka were selected based on their higher area under paddy cultivation, resulting in 12 selected villages. Ten paddy growers were selected from each selected village. Thus, 120 paddy growers constituted the final sample. Data were collected through personal interviews at the respondents' homes, fields and workplaces using a pre-tested structured interview schedule.

4. Results and Discussion

4.1. Profile of paddy growers

The major profile characteristics of paddy growers are presented in Table 1.

Table 1: Profile characteristics of paddy growers (n=120)

Sr. No.	Variables	Category	Respondents (n=120)	
			Frequency	Percentage
1	Age	Young (up to 35 years)	15	12.50
		Middle (36–50 years)	58	48.33
		Old (above 50 years)	47	39.17
		Total	120	100.00
2	Education	Illiterate	02	01.67
		Primary school	11	09.17
		Middle school	13	10.83
		Secondary school	46	38.33
		Higher secondary	33	27.50
		College and above	15	12.50
		Total	120	100.00
3	Landholding	Marginal (up to 1.00 ha)	25	20.83
		Small (1.01–2.00 ha)	57	47.50
		Semi-medium (2.01–4.00 ha)	38	31.67
		Total	120	100.00
4	Occupation	Agriculture (Farming)	40	33.33
		Agriculture + labour	45	37.50
		Agriculture+subsidiary occupation	17	14.17
		Agriculture + business	08	06.67
		Agriculture + service	10	8.33
		Total	120	100.00
5	Annual income	Up to ₹2,00,000	43	35.83
		₹2,00,001–₹4,00,000	53	44.17
		Above ₹4,00,000	24	20.00
		Total	120	100.00
6	Area under paddy	Up to 1.00 ha	25	20.83
		1.01–2.00 ha	57	47.50
		Above 2.00 ha	38	31.67
		Total	120	100.00
7	Experience	Up to 10 years	10	8.33
		11–20 years	45	37.50
		Above 20 years	65	54.17
		Total	120	100.00
8	Income from paddy	Up to ₹50,000	42	35.00
		₹50,001–₹1,00,000	54	45.00
		Above ₹1,00,000	24	20.00
		Total	120	100.00
9	Access to credit	Credit accessed	112	93.33
		Credit not accessed	08	06.67
		Total	120	100.00
10	Source of information	Low (upto10)	51	42.50
		Medium (11 -15)	59	49.17
		High(above15)	10	08.33
		Total	120	100.00
11	Training received	Training received	10	08.33
		Training not received	110	91.67
		Total	120	100.00
12	Labour availability	Adequate	96	80.00
		Inadequate	24	20.00
		Total	120	100.00
13	Attitude index	Less favorable (up to 10)	07	05.83
		Moderately favourable (11-15)	38	31.67
		Highly favourable (above 20)	75	62.50
		Total	120	100.00
14	Knowledge about plant protection	Low (upto 33.33)	20	16.67
		Medium (33.34-66.66)	55	45.83
		High (above 66.66)	45	37.50
		Total	120	100.00

Nearly half of the respondents (48.33%) belonged to the middle-age group of 36–50 years, followed by 39.17 per cent in the old-age group and 12.50 per cent in the young-age group. The mean age of respondents was 47.44 years. Thus, paddy cultivation in the study area was largely managed by middle-aged and older farmers. Similar observations were reported by Amrut (2013) ^[1], Ghimire and Kafle (2014) ^[3]. The largest proportion of respondents (38.33%) had completed secondary school, followed by 27.50 per cent with higher secondary education and 12.50 per cent with college-level education. Only 1.67 per cent were illiterate. The educational profile indicates that most respondents had at least basic formal education the present finding is in accordance with the findings of Sharma (2019) ^[10]. Small farmers having 1.01–2.00 ha constituted the largest group (47.50%), followed by semi-medium farmers (31.67%) and marginal farmers (20.83%). 37.50 per cent were engaged in agriculture along with labour work, while 33.33 per cent were engaged exclusively in farming. This reflects the importance of agriculture and agricultural labour as major livelihood activities. The present finding is in accordance with the findings of Sharma (2019) ^[10]. The largest proportion of respondents (44.17%) belonged to the medium annual-income group of ₹2,00,001–₹4,00,000. Nearly half of respondents (47.50 per cent) cultivated paddy on 1.01–2.00 ha. More than half of the respondents (54.17%) had more than 20 years of experience in paddy cultivation, with a mean experience of 25.47 years. Medium income from paddy cultivation (₹50,001–₹1,00,000) was reported by 45.00 per cent of respondents,

with a mean income of ₹81,240. A very high proportion (93.33%) had access to agricultural credit. These findings indicate that the sample consisted largely of experienced farmers cultivating paddy on relatively small holdings. Nearly half of the respondents (49.17%) had a medium level of source of information, followed by 42.50 per cent with a low level and 8.33 per cent with a high level of source of information. A major gap was observed in formal training: only 8.33 per cent had received training, whereas 91.67 per cent had not received training. Adequate for 80.00 per cent and inadequate for 20.00 per cent of respondents. These characteristics are important for understanding the constraints reported by the farmers. A high favourable attitude towards plant protection was observed among 62.50 per cent of respondents, while 31.67 per cent had moderately favourable attitude. The majority (45.83%) had medium knowledge about recommended plant protection measures, followed by 37.50 per cent with high knowledge and 16.67 per cent with low knowledge. The mean knowledge index was 61.81. Knowledge was relatively better regarding commonly recognized pests and diseases, whereas knowledge of their symptoms and specific management practices was comparatively lower.

4.2. Constraints faced by paddy growers in adoption of recommended plant protection measures

The constraints faced by paddy growers in adoption of recommended plant protection measures are presented in Table 2.

Table 2: Constraints faced by paddy growers in adoption of recommended plant protection measures (n=120)

Sr. No.	Constraint	Frequency	Percentage	Rank
1	High cost of pesticides and spraying equipment	72	60.00	I
2	Inadequate training on plant protection measures	65	54.17	II
3	Difficulty in identifying pests and diseases at the early stage	58	48.33	III
4	Lack of timely technical guidance from extension personnel	52	43.33	IV
5	Lack of technical knowledge about recommended plant protection measures	47	39.17	V

The High cost of pesticides and spraying equipment ranked first, as reported by 60.00 per cent of respondents. This indicates that the expenditure involved in plant protection inputs and application equipment was a major economic barrier. The result is consistent with the final thesis interpretation that economic constraints were among the important factors limiting adoption. Inadequate training ranked second (54.17%). This finding is particularly important because only 8.33 per cent of respondents had actually received training, while 91.67 per cent had not. The training gap may limit farmers' practical ability to identify pests and diseases, select appropriate measures and apply them at the correct time. Difficulty in identifying pests and diseases at the early stage was reported by 48.33 per cent of respondents. Early diagnosis is important because plant protection interventions are generally more effective when implemented at the appropriate stage. A Lack of timely technical guidance from extension personnel was reported by 43.33 per cent, highlighting the need for regular field-level extension contact. A Lack of timely technical knowledge about recommended plant protection measures was reported by 39.17 per cent of respondents. Taken together, the findings indicate that adoption barriers were not limited to financial

constraints; knowledge, diagnostic ability, training and timely extension support also played an important role. The finding indicate that high input costs, inadequate training and insufficient technical guidance were the major factors limiting adoption.

5. Conclusion

The study showed that paddy growers in the selected area of Gadchiroli were predominantly middle-aged or older, with secondary-level education, small land holdings and substantial experience in paddy cultivation. A considerable proportion depended on agriculture and agricultural labour for their livelihood and most respondents had access to agricultural credit. However, access to formal training was very limited, with only 8.33 per cent of respondents reporting training.

The major constraints in adoption of recommended plant protection measures were high cost of pesticides and spraying equipment and inadequate training, difficulty in early identification of pests and diseases, lack of timely technical guidance and lack of technical knowledge. Therefore, improving in adoption requires an integrated extension approach that combines practical training, village-level

demonstrations, timely advisories and better access to affordable plant protection inputs.

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