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Knowledge and adoption gap of farmers about recommended paddy cultivation practices

[1]Janhavi V Bisen, [2]Dr. PP Wankhade, [2]Dr. MK Rathod, [1]Tanuja C Nagpure, [1]Supriya C Modve and [1]Prapti D Raut

[1]PG Scholar, Agricultural Extension Education Section, College of Agriculture, Nagpur, Maharashtra, India

[2]Professor (CAS), Agricultural Extension Education Section, College of Agriculture, Nagpur, Maharashtra, India

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Corresponding Author: Janhavi V Bisen

Abstract

The study aimed to assess the knowledge and adoption gap among paddy farmers in Gondia district of Maharashtra, regarding recommended cultivation practices. A sample of 120 farmers from 12 villages was selected through random sampling method. Data were collected via structured interviews and analyzed using standard indices. Results showed that 86.67% of farmers had a high level of knowledge, especially in practices like ploughing (100%) and puddling (88.33%), while awareness was low for clipping seedling tops (20.83%) and zinc sulphate application (40.83%).

Adoption gap analysis revealed that 83.33% of farmers had a medium-level gap, with full adoption for ploughing but significant gaps in clipping (79.17%) and hoeing (76.67%). The findings emphasize the need for focused extension efforts to improve adoption of critical paddy technologies.

Keywords: Knowledge, adoption gap, paddy growers

Introduction

Paddy (Oryza sativa) remains one of the most crucial cereal crops globally, serving as the primary food source for more than half of the world's population. In India, rice is a staple for nearly 60% of the population and plays a significant role in the country's cultural heritage and rural economy. The Eastern Vidarbha region of Maharashtra encompassing the districts of Bhandara, Gondia, Chandrapur, and Gadchiroli is particularly favorable for paddy cultivation. This is attributed to the region's fertile alluvial soils, substantial rainfall, and reliable water availability from the Wainganga River system. Gondia district alone accounts for approximately 2.15 lakh hectares of rice cultivation area and is recognized for its substantial production levels. However, despite the advancements introduced during the Green Revolution, many farmers have yet to fully adopt improved and recommended agricultural practices. Bridging this adoption gap is crucial to increasing yield potential, ensuring long-term food security, and enhancing the sustainability of rice-based farming systems.

This study focuses on evaluating the knowledge levels and the extent of the adoption gap among paddy farmers in Eastern Vidarbha, with special emphasis on the Gondia district. The findings are expected to guide targeted interventions to promote the adoption of advanced cultivation practices in the region. Keeping this view the present study was carried out with following objective.

Objective

To study the knowledge level and adoption gap among paddy growers with respect to recommended practices.

Materials and Methods

The study was conducted in Gondia district, located in the eastern Vidarbha region of Maharashtra, which is known for its paddy-based cropping pattern. Gondia and Tirora talukas were purposively selected due to their larger area under paddy cultivation. From each taluka, six villages were selected randomly, resulting in a total of 12 villages. Ten paddy farmers were randomly chosen from each village, making a total sample size of 120 respondents. The data collection was carried out using a structured interview schedule through face-to-face interviews. An exploratory research design was adopted to assess the knowledge level and adoption gap regarding recommended paddy cultivation practices.

Knowledge was measured using a two-point scale (Yes = 1, No = 0) for each recommended practice. The scores were summed to calculate each farmer’s knowledge score and converted into a knowledge index by dividing the actual score by the maximum possible score and multiplying by 100. Based on the index, farmers were categorized into low (up to 33.33), medium (33.34 to 66.66), and high (above 66.66) knowledge levels. The adoption gap was defined as the difference between recommended and actually adopted practices, assessed using a three-point scale: no gap (2), partial gap (1), and full gap (0). The adoption gap index was calculated by subtracting the adoption score from the recommended score, dividing by the recommended score,

and multiplying by 100. Farmers were similarly classified into low, medium, and high adoption gap levels using the equal interval method.

Results and Discussion

The study findings are presented under the following headings.

Table 1: Distribution of respondents according to their practice wise knowledge and adoption gap about recommended paddy cultivation practices**.**

Sl. No.	Recommended practices	Knowledge		Adoption gap		
		Farmers response		FG (0)	PG (1)	NG (2)
		Yes (1)	No (0)			
1.	**Land preparation**					
	a) Ploughing (In the month of May- June)	120 (100.00)	0 (0.00)	0 (00.00)	0 (00.00)	120 (100.00)
	b) Harrowing (by blade or disc harrow)	114 (95.00)	6 (05.00)	6 (5.00)	43 (35.83)	71 (59.17)
	c) Application of green manure (Sunhemp, Dhaincha, Berseem, Gliricidea)	82 (68.33)	38 (31.67)	38 (31.67)	55 (45.83)	27 (22.50)
	d) Application of compost/FYM (10 tons/ha)	99 (82.50)	21 (17.50)	21 (17.50)	40 (33.33)	59 (49.17)
2.	**Nursery**					
	a) Selection of improved varieties 1) Short duration - 115-120 days (Sakoli-6, Sindewahi - 1, PDKV Sadhana) 2) Medium duration - 120-140 days (PDKV HMT, PDKV Ganesh, Sakoli-9) 3) Long duration - 140-150 days (PDKV Tilak, Sindewahi-5, Sakoli-8)	84 (70.00)	36 (30.00)	36 (30.00)	61 (50.83)	23 (19.17)
	b) Raised bed (width -100 cm, height 10 cm)	91 (75.83)	29 (24.17)	29 (24.17)	41 (34.17)	50 (41.67)
3.	**Seed rate**					
	a) Fine grain variety - 35-40 kg/ha	92 (76.67)	28 (23.33)	28 (23.33)	23 (19.17)	69 (57.50)
	b) Bold grain variety - 45-50 kg/ha	83 (69.17)	37 (30.83)	37 (30.83)	31 (25.83)	52 (43.33)
4.	**Seed treatment**					
	a) Seed soaking -With brine solution -3% = 300 g salt + 10 litre of water	101 (84.17)	19 (15.83)	19 (15.83)	59 (49.17)	42 (35.00)
	b) Application of thirum 3 g/kg seed before sowing / seed treatment with biofertilizer	90 (75.00)	30 (25.00)	30 (25.00)	68 (56.67)	22 (18.33)
5.	**Sowing** Line sowing on seed bed (1-72cm deep, 7cm line distance) on onset of monsoon in May-June	105 (87.50)	15 (12.50)	15 (12.50)	9 (07.50)	96 (80.00)
6.	**Puddling** After harrowing with cage wheel attached to tractor and one day before transplanting (water -2.5 cm)	106 (88.33)	14 (11.67)	14 (11.67)	05 (04.17)	101 (84.17)
7.	**Transplanting**					
	a) By SRI method (8-15 days old seedling) or by machine, direct wet seedling, direct dry seedling, 2-3 seedling at a hill by improved method up to 2-4 cm deep in upright position.	101 (84.17)	19 (15.83)	19 (15.83)	56 (46.67)	45 (37.50)
	b) Clip seedling tops before transplanting to remove egg masses.	25 (20.83)	95 (79.17)	95 (79.17)	11 (09.17)	14 (11.67)
	c) Spacing (SRI: 25 cm x 25 cm Early duration - 20 × 10 cm, Mid- late and late duration - 20 × 20 cm)	89 (74.17)	31 (25.83)	31 (25.83)	38 (31.67)	51 (42.50)
8.	**Nutrient management**					
	a) Recommended dose of fertilizer i.e., NPK 100:50:50 per ha.	84 (70.00)	36 (30.00)	36 (30.00)	44 (36.67)	40 (33.33)
	b) Application of fertilizer NPK as split dose first half Nitrogen and full dose of P_2O_5 and K_2O at the time of sowing (basal dose).	73 (60.83)	47 (39.17)	47 (39.17)	51 (42.50)	22 (18.33)
	c) Application of 25% nitrogen dose-one month after sowing.	81 (67.50)	39 (32.50)	39 (32.50)	22 (18.33)	59 (49.17)
	d) Remaining 25% nitrogen at flowering or flag leaf initiation stage	66 (55.00)	54 (45.00)	54 (45.00)	52 (43.33)	14 (11.67)
9.	**Weed management**					
	a) First weeding (14 to 21 DAT)	91 (75.83)	29 (24.17)	29 (24.17)	06 (05.00)	85 (70.83)
	b) Second weeding (30 to 45 DAT)	54 (45.00)	66 (55.00)	66 (55.00)	14 (11.67)	40 (33.33)
	c) Hoeing (30 to 45 DAT)	28 (23.33)	92 (76.67)	92 (76.67)	20 (16.67)	08 (06.67)
	d) Application of herbicide 1. Pre- emergence (2 to 5 DAT): Butachlor 50% EC @ 2.5 to 4 lit/ha, Pretilachlor 50% EC	94 (78.33)	26 (21.67)	26 (21.67)	55 (45.83)	39 (32.50)

	@ 1 to 1.5 lit/ha. 2. Post- emergence (10 to 15 DAT): Bis-pyripac sodium @ 10% SC, 2-4 D Sodium salt 1.25 kg/ha.					
10.	**Plant protection measures**					
	a) To control the sucking pests (Plant hoppers) insecticide like Imidacloprid 0.3 ml/lit, Carbofuron 25 kg	96 (80.00)	24 (20.00)	24 (20.00)	21 (17.50)	75 (62.50)
	b) To control rice stem borer and gall meidge insecticide like Carbofuran 3% CG 25kg/ha, Cartap hydrochloride 50% SP 18 kg/ha OR use parasitoid like *Trichogramma japonicum* @ 5 card/ha 3 times at weekly interval.	70 (58.33)	50 (41.67)	50 (41.67)	55 (45.83)	15 (12.50)
11.	**Disease management**					
	a) Systemic fungicides like Triazoles, Cabandazium 50% WP, Copper hydroxide, Hexaconazole, Streptamycine etc., are used to control blast, bacterial blight, brown spot, stem rot, leaf scald, sheath blight disease	77 (64.17)	43 (35.83)	43 (35.83)	49 (40.83)	28 (23.33)
	b) 25kg/ha zinc sulphate is applied to prevent khaira disease	49 (40.83)	71 (59.17)	71 (59.17)	30 (25.00)	19 (15.83)
12.	**Harvesting** 25-30 days after panicle initiation	113 (94.17)	07 (5.83)	07 (05.83)	05 (04.17)	108 (90.00)
13.	**Threshing** By paddy winnower or paddy thresher after completely drying the crop	112 (93.33)	08 (6.67)	08 (06.67)	01 (00.83)	111 (92.50)

The study revealed that paddy growers in Gondia district possessed a generally good understanding of recommended practices. Complete awareness was recorded for ploughing (100%), while high awareness levels were seen for harrowing (95%), FYM application (82.5%), and puddling (88.33%). Knowledge of green manuring stood at 68.33%. In nursery practices, 70% were familiar with improved varieties and 75.83% with raised bed preparation. Seed rate awareness was 76.67% for fine varieties and 69.17% for bold types. For seed treatment, 84.17% were aware of brine solution and 75% of Thirum or biofertilizer use. Practices such as line sowing (87.5%), transplanting (84.17%), and spacing (74.17%) showed good awareness, whereas only 20.83% were aware of clipping seedling tops.

In nutrient management, 70% knew the recommended NPK dose, while awareness of split application varied from 60.83% (general split dose) to 55% (second split). Weed management knowledge was higher for the first weeding (75.83%) and herbicide use (78.33%) but relatively low for second weeding (45%) and hoeing (23.33%). Plant protection awareness was 80% for sucking pests, 58.33% for stem borer, and 64.17% for fungicide use. Only 40.83% knew about zinc sulphate application. Harvesting (94.17%) and threshing (93.33%) showed excellent knowledge levels.

Adoption analysis indicated full compliance in ploughing (100%) and high adoption of puddling (84.17%) and harvesting (90%). Moderate adoption was observed for harrowing (59.17%), while FYM and green manuring showed partial adoption gaps of 34.17% and 45.83%, respectively. Practices like improved seed varieties and treatments had notable partial gaps. Clipping tops (79.17% full gap), second weeding (55%), hoeing (76.67%), and zinc sulphate application (59.17%) reflected major adoption gaps. Conversely, threshing (92.5%) showed strong adherence, indicating better compliance with post-harvest operations.

Table 2: Distribution of respondents according to their knowledge level

Sl. No.	Knowledge Index	Respondents (n=120)	
		Frequency	Percentage
1.	Low (Up to 33.33)	05	04.17
2.	Medium (33.34 to 66.66)	11	09.17
3.	High (Above 66.66)	104	86.67
	Total	120	100.00
	Mean= 71.30	SD= 10.42	

Table 2, presents the distribution of respondents based on their knowledge of improved paddy cultivation practices. The majority (86.67%) demonstrated a high level of knowledge, followed by 9.17% with a moderate level, and only 4.17% fell into the low knowledge category.

Table 3: Distribution of respondents according to their adoption gap level

Sl. No.	Adoption Gap Index	Respondents (n=120)	
		Frequency	Percentage
1.	Low (Up to 33.33)	12	10.00
2.	Medium (33.34 to 66.66)	106	88.33
3.	High (Above 66.66)	2	01.67
	Total	120	100.00
	Mean= 42.92	SD= 08.43	

As shown in Table 3, the majority of respondents (83.33%) exhibited a medium level of adoption gap, while 12.50% reported a low gap and only 4.17% faced a high adoption gap. These findings suggest that although improved paddy cultivation practices are being adopted to some extent, full implementation remains limited for a significant number of farmers.

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