The Pharma Innovation Journal 2022; SP-11(7): 4487-4489

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(7): 4487-4489

www.thepharmajournal.com
Received: 16-05-2022
Accepted: 19-06-2022

Sneha N
M.Sc. Agricultural Extension Student, College of Agriculture, Kerala Agricultural University, Thrissur, Kerala, India

Dr. Allan Thomas
Associate Professor and Head, Communication Centre, Kerala Agricultural University, Mannuthy, Thrissur, Kerala, India

Dr. Nishan MA
Assistant Professor, Department of Agronomy, College of Agriculture, Kerala Agricultural University, Thrissur, Kerala, India

Dr. Brigit Joseph
Associate Professor and Head, Department of Ag. Statistics, College of Agriculture, Kerala Agricultural University, Thrissur, Kerala, India

Corresponding Author
Sneha N
M.Sc. Agricultural Extension student, College of Agriculture, Kerala Agricultural University, Thrissur, Kerala, India

Technology adoption of paddy in North Kerala

Sneha N, Dr. Allan Thomas, Dr. Nishan MA and Dr. Brigit Joseph

Abstract
Technology plays a vital role in developing farming industry and improving agribusiness. Technology adoption helps the farmers to apply scientific data and technology to advance crop yields and keep themselves informed with the cutting edge approaches of farming. This is exactly where the significance of finding the extent of adoption of technologies pronounces. The study entitled 'Yield gap and technology adoption of rice in North Kerala: a multi-dimensional analysis' which pertained 105 paddy farmers, with 15 each from Kasaragod, Kannur, Kozhikode, Wayanad, Palakkad, Thrissur and Malappuram districts, was done during the period, 2020-2021. This research was conducted so as to determine the extent of adoption of chosen KAU production practices. After consulting the subject matter specialists, sixteen recommended practices in paddy cultivation were selected. When the overall technology adoption was assessed, it showed up that 51.42 per cent of farmers belonged to medium category of adoption, followed by 24.76 per cent with low adoption level and 23.80 per cent with high adoption level. In the case of technology adoption of plant production practices, 48.57 per cent of the respondents belonged to medium adopter category, 26.67 per cent were high adopters and 24.76 per cent were low adopters. Whereas, in the case of plant protection practices, low adopter category (40%) was higher than the medium adopter category (39.05%) followed by 20.95 per cent in the high adopter category.

Keywords: Level of adoption, Kerala, paddy, practices, technologies, yield

Introduction
Rice is a universal staple which provides nourishment and energy for more than half of the global population (Akighir and Shabu, 2011; Nwanze *et al.*, 2006 and Zhou *et al.*, 2002) [4, 14, 19]. In Kerala the legacy of rice cultivation ages back to 3000 B.C (Manilal, 1991; Kumar and Kunhamu, 2021) [13, 11]. Even though it is extensively cultivated it is still a "scarce" subsistence crop. This is exactly the answer as to why we should give more emphasis on improving the paddy productivity. Green revolution has led to the adoption of enhanced agricultural production techniques and made Asia essentially self-contained in rice production (Huy, 2007) [8]. This substantiates that adoption of enhanced agricultural techniques can improve the productivity of rice. Adoption of technologies is a must for an improved agricultural scenario as far as today's economy is considered. Thinning the gap between native demand and production would entail execution of actions, not only to inflate the area under cultivation, but also, surge rice yields by at least 50% (Aker *et al.*, 2011; Olaf and Emmanuel, 2009) [3, 15]. Against this background, farm resources must to be utilised more capably in order to diminish wastage and proliferate output. Technical efficacy is a crucial element for the growth in productivity. It measures the degree to which output can be elevated without increasing input usage under a particular production technology (Alhassan, 2008). Quick advancement and amplified rate of obsolescence of technologies necessitate technology foretelling for any planning course (Thomas and Kumar, 2015) [18].

Methodology
Research Design
Ex-post facto research design

Location of study
The study was conducted in seven districts (Kasaragod, Kannur, Kozhikode, Wayanad, Palakkad, Thrissur and Malappuram) of North Kerala. The panchayat having maximum rice area under cultivation was selected after consulting the Principal Agricultural Office (PAO) of the districts. 15 farmers having a minimum of 50 cents (0.2 ha) was chosen, from the selected panchayath, Thus, a total of 105 farmers from the seven districts were selected as respondents

of the study. Survey method using a well-structured pre tested interview schedule was employed for the collection of responses from the rice farmers.

Operationalisation and measurement of variables

Extent of adoption of selected recommended practices for paddy cultivation was measured. Adoption refers to the extent to which farmers make full use of the recommended practices in paddy cultivation. The extent of adoption was calculated by measuring the adoption quotient using the formula developed by Singh and Singh (1967) [17].

$$AQ = \frac{\sum_{i=1}^{n} \frac{e_i}{p_i} \times 100}{N}$$

Where,
AQ = Adoption quotient
ei = Extent of adoption of each practice
pi = Potentiality of adoption of each practice
N = Total number of practices selected

The respondents were segregated into high, medium and low category with reference to the extent of adoption of recommended practices based on quartiles. The respondents were also classified into the various adopter categories and compared to Roger's standard adoption curve. Different scoring procedures were utilised for measuring the adoption quotient of various practices. For quantifiable data like seed rate, spacing etc., the original numerical data given as extent of adoption (ei) was considered as the potentiality of adoption of that practice.

Few practices were measured in terms of various stages of adoption. Level of adoption of each farmer was indicated on a 15 point adoption scale. The weighted values corresponding to the response categories were non- adoption (0), awareness (1), interest (3), evaluation (6), trial (10) and adoption (15).Those practices which could not be quantified were scored dichotomously as 'Yes' or 'No' with the maximum score '1' for the response 'Yes' and minimum score '0' for response 'No'

.

Results and Discussion

The distribution of respondents based on the overall extent of adoption of recommended practices by paddy farmers is presented in Table 1 and fig. 1. The respondents were classified into high, medium and low adopters based on endorsed practices in paddy. From table 1, it is evident that 51.42 per cent of the respondents belonged to the medium adopter category followed by 24.76 per cent of low adopters and 23.80 per cent of high adopters of recommended practices.

Table 1: Distribution of respondents based on overall extend of adoption

Category	Palakkad		Malappuram		Thrissur		Kozhikode		Wayanad		Kannur		Kasaragod		Total	
	n=15	%	n=15	%	n=15	%	n=15	%	n=15	%	n=15	%	n=15	%	n =105	%
<29.58 (Low)	0	0	3	20	4	26.67	7	46.67	4	26.67	4	26.67	4	26.67	26	24.76
29.58-40.83 (Medium)	11	73.33	6	40	6	40	4	26.67	10	66.67	10	66.67	5	33.33	54	51.42
>40.83 (High)	4	26.67	6	40	5	33.33	4	26.67	1	6.67	1	6.67	6	40	25	23.80
Total	15	100	15	100	15	100	15	100	15	100	15	100	15	100	Mean 35.63 SD 8.41 SE 0.82 Max 58.75 Min 16.25	

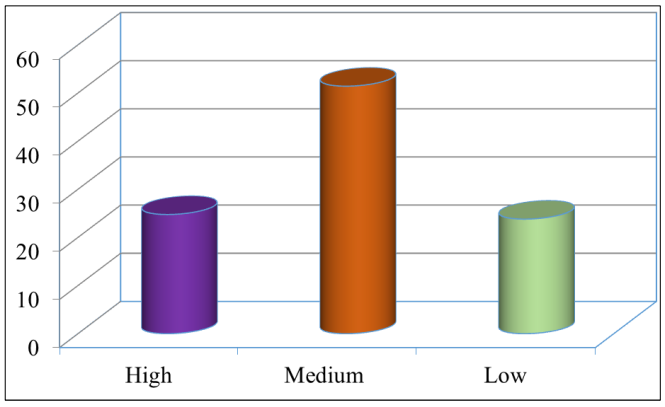

Fig 1: Graphical representation of distribution of farmers based on extent of adoption

The farmer respondents were classified into different adopter categories in comparison to Roger's standard adoption curve namely, innovators, early adopters, early majority, late majority and laggards which are presented in table 2 along with graphical representation in figure 2. Table 2 and fig. 2 reveals that the respondents fitting to innovator category were 0.95 per cent which was lower than the standard Roger's adoption curve. Early adopter category formed 17.14 per cent which was nearly similar to the standard curve. The early majority (33.33%) and late majority (34.29%) were also almost similar to the values in Roger's standard curve. All these values indicate a reasonably decent level of adoption of recommended practices by the farmers. The table also describes that the composition of laggards was 14.29 per cent, which was lesser compared to the standard value of 16 per cent. The lower proportion of dawdlers reveals that there is high adoption of practices which can again be improved by active intervention of extension agents and other extension personnel.

Table 2: Categorization of rice farmers of North Kerala into different adopter categories with reference to Roger's standard adoption curve

Category	Frequency	Percentage	Standard Percentage
Innovators(<45)	1	0.95	2.50
Early adopters(45-65)	18	17.14	13.50
Early majority(66-86)	35	33.33	34.00
Late majority(87-106)	36	34.29	34.00
Laggards(>106)	15	14.29	16.00

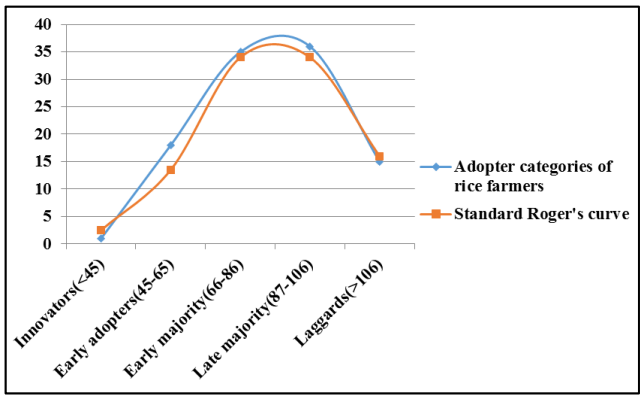

Fig 2: Graphical representation of adopter categories of the rice farmers v/s Rogers standard curve

Based on the extent of adoption of recommended plant production practices the distribution of paddy farmers is presented in table 3 and graphically portrayed in figure 3. The respondents were classified into high, medium and low adopter categories based on the level of adoption of recommended production practices of paddy. By examining table 3 and figure 3 it is obvious that majority of farmers fall under medium category (48.57%), followed by high (26.67%) and low (24.76%) adopter category. There was only a minor difference between the dispersal of respondents between high and low category. There was no respondent who completely adopted all the practices recommended by KAU for paddy cultivation. Hence there is a space for further adoption. More use of latest production technologies will consequently alter the alarming trend of bolting extension gap (Joshi *et al*., 2014, Kumar *et al*., 2014 and Kulkarni *et al*., 2018) [12, 10].

Table 3: Overall distribution of respondents based on extend of adoption of plant production practices

Adoption category	No. of respondents	Mean	10.05
Low	24.76	SD	11.44
Medium	48.57	SE	1.12
High	26.67	Maximum	46.67
		Minimum	0

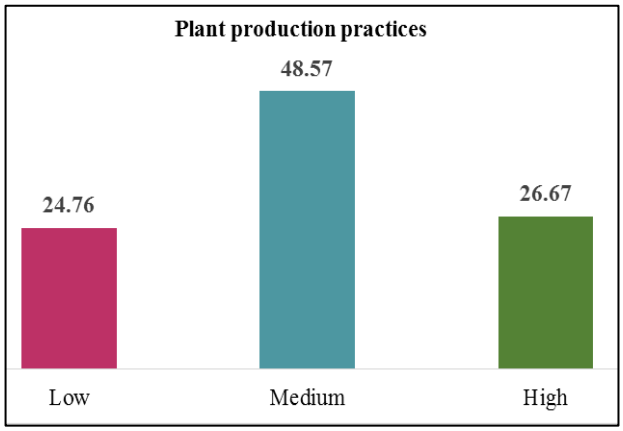

Fig 3: Graphical representation of the overall distribution of respondents based on extend of adoption of plant production practices

The respondents were classified into different categories of adoption as explained by Rogers (1982) namely, innovators, early adopters, early majority, late majority and laggards. Table 4 and the conforming figure 4 reveals that the percentage of innovators were 0.95 per cent which is less than the Roger's standard curve (2.5%). Early adopters were 16.19 per cent which is greater than the Roger's standard curve (13.5%). Early majority were 37.14 per cent which is greater than 34 per cent in the standard curve. Late majority were 28.57 per cent which is less than 34 per cent of Rogers curve. High percentage of respondents in early majority category and low percentage in late majority is a positive indicator of adoption. Laggards constituted 17.14 per cent which is almost in conformity with the 16 per cent laggard population of standard Rogers curve. The high proportion of early adopters and early majority whereas less per cent of innovators indicates that farmers are more of influential in nature so that they make decisions as a group rather than individually. Farmers who fit in to a farmer group had greater prospect of adopting more rice cultivation practices (Abdallah *et al*., 2014) [1]

The findings signify that a bit more of effective extension intervention along with sustenance and motivation can reduce the percentage of late majority further, which will enhance the percentage of early majority and early adopters. Exertions should be given on evolving and distributing site specific and viable production practices rendering to the requirement of the farmers.

Table 4: Categorization of rice farmers of North Kerala into different adopter categories based on plant production practices with reference to Roger's standard adoption curve

Category	Frequency	Percentage	Standard Percentage
Innovators(<45)	1	0.95	2.50
Early adopters(45-65)	17	16.19	13.50
Early majority(66-86)	39	37.14	34.00
Late majority(87-106)	30	28.57	34.00
Laggards(>106)	18	17.14	16.00

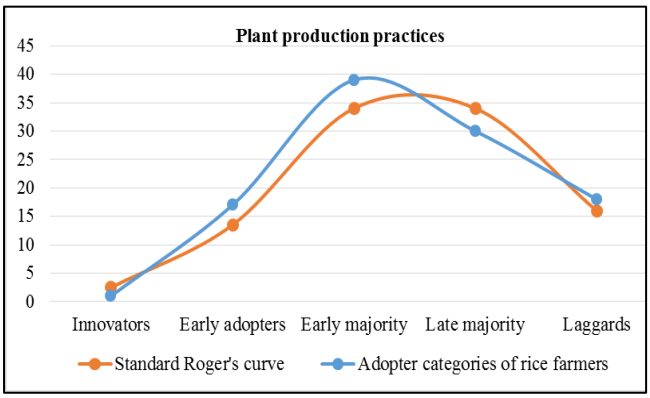

Fig 4: Graphical representation of categorization of rice farmers into different adopter categories based on plant production practices with reference to Roger's standard adoption curve

The distribution of respondents based on the extent of adoption of recommended plant protection practices by paddy farmers is presented in table 5 and graphically illustrated in figure 5. The respondents were classified into high, medium and low adopter category based on the adoption of recommended protection practices by the paddy farmers. From table 5 and fig. 5, it is clear that maximum respondents, 40 per cent fall under the low adoption category followed by 39.05 per cent in medium adopter category and 20.95 per cent of respondents under high adoption category.

Table 5: Overall distribution of respondents based on extend of adoption of plant production practices

Adoption category	No. of respondents	Mean	10.05
Low	40	SD	11.44
Medium	39.05	SE	1.12
High	20.95	Maximum	46.67
		Minimum	0

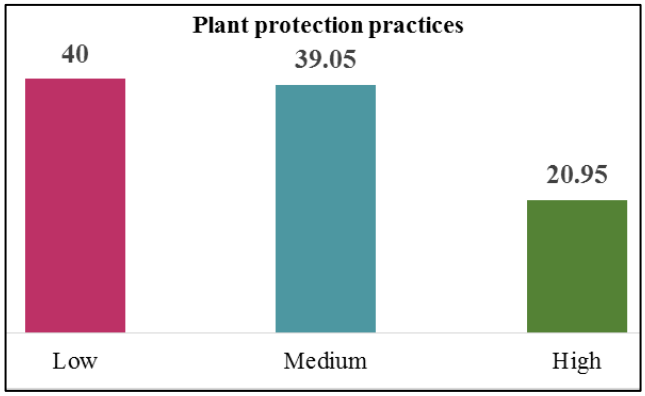

Fig 5: Graphical representation of the overall distribution of respondents based on extend of adoption of plant protection practices

The respondents were classified into different adopter categories based on Roger's standard adoption curve which involves innovators, early adopters, early majority, late majority and laggards which is presented in table 6 and figure 6. It can be observed that percentage of innovators were zero corresponding to 2.5 per cent in the standard Rogers curve. Early adopters were 40 per cent which is way greater than the 13.5 per cent in Rogers curve. Early majority was 25.71 per cent and late majority was 16.19 per cent respectively is less than the 34 per cent of Roger's standard values. Laggards instituted 18.10 per cent which is again greater than 16 per cent of standard Rogers curve. The fact that there were no innovators signify that the respondents were not at all ready to welcome a new idea all of a sudden. However the high per cent of early adopter category is surely a positive aspect. Farmers are reluctant to try protection practices due to numerous reasons like the efficiency, sustainability, cost and revenues of the technologies. Hence extension efforts should put more attention on effective transfer of those protection practices after recognizing the reasons, as the laggard category of farmers are averse to adopt, thereby reducing their proportion to a great magnitude and thus increasing the level of adoption. Farmers who had access to agricultural extension service adopted more of the technologies compared to those who didn't have access. An increase in speed of technology transfer can decrease the gap in yield at a greater pace (Abdulai, 2015; Donkoh and Awuni, 2011, Ransom *et al.*, 2003; Doss and Morris, 2001) [2, 6, 16, 7]

Table 4: Categorization of rice farmers of North Kerala into different adopter categories based on plant protection practices with reference to Roger's standard adoption curve

Category	Frequency	Percentage	Standard Percentage
Innovators(<45)	0	0	2.50
Early adopters(45-65)	42	40	13.50
Early majority(66-86)	27	25.71	34.00
Late majority(87-106)	17	16.19	34.00
Laggards(>106)	19	18.10	16.00

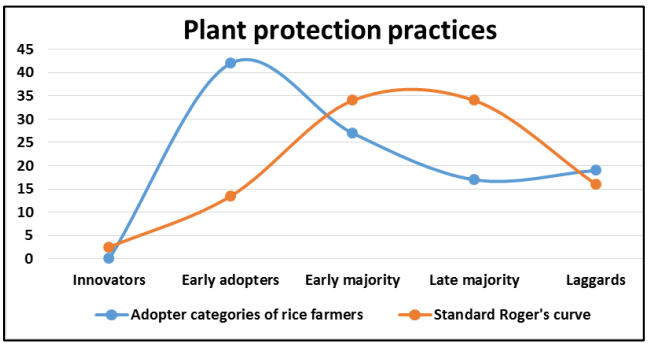

Fig 6: Graphical representation of categorization of rice farmers into different adopter categories based on plant protection practices with reference to Roger's standard adoption curve

Conclusion

Technology adoption is a factor of prime importance in determination of the extent of progressiveness among the farmers in cultivation. A better adoption indicates better utilization of resources, reduced time consumption as well as improved productivity. The technology adoption valuation revealed that even though the farmers were having a decent overall adoption of recommended practices, when comparing the production practices to protection practices, the farmers were more keen to adopt production practices rather than protection. This unwinds the requirement of making the farmers aware of the importance of adopting the recommended protection practices better so as to ensure a good yield. Influential and enhanced technologies can definitely shrink the strain of farmers so that they can get a good volume of harvest.

References

1. Abdallah A, Ayamga M, Donkoh SA. Smallholder adoption of soil and water conservation techniques in Ghana. Afr. J. Agric. Res. 2014;9(5):539-546.
2. Abdulai S. Technical efficiency of maize production in Northern Ghana University for Development Studies, Tamale, Ghana. 2015.
3. Aker JC, Block S, Ramachandran V, Timmer PC. West African experience with the world rice crisis, 2011. Working Paper 242. Washington, D.C.: Center for Global Development. 2007– 2008.
4. Akighir DT, Shabu T. Efficiency of resource use in rice farming enterprise in Kwande Local Government Area of Benue State, Nigeria. Int. J. Humanit. Soc. Sci. 2011, 1(3).
5. Alhassan S. Technical efficiency of rice farmers in Northern Ghana. African Economic Research Consortium Research Paper. 2008, 178.
6. Donkoh SA, Awuni J. A. Adoption of Farm Management Practices in Lowland Rice Production in Northern Ghana. J Agric. Biol. Sci. 2011;2(4):84-93.
7. Doss CR., Morris ML. How does gender affect the adoption of agricultural innovations? The case of improved maize technology in Ghana. Agric Econ 2001;25:27-39.
8. Huy HT. Technical efficiency of rice-producing households in the Mekong Delta of Vietnam. Asian J Agric Dev. 2007;6(2):35.
9. Joshi NS, Bariya MK, Kunjadia BB. Yield gap analysis through front line demonstration in wheat crop. Int. j. sci. res. publ. 2014;4(9):1-3.
10. Kulkarni S, Renuka B, Arvind R, Prakash S. Impact of

frontline demonstration on adoption of improved practices of sunflower (*Helinathus annuss L.*). Int. J. Curr. Microbiol. 2018;7(9):2511-2515.
11. Kumar BM, Kunhamu TK. Ecological and historical perspectives of rice cultivation in Kerala: a synthesis. Oryza. 2021;58(2):241-261
12. Kumar J, Singh YP, Rana DK. Yield and gap analysis of wheat (Triticum aestivum) productivity in NCR Delhi. Indian J Ext. Educ. 2014;50 (1 & 2):56-58.
13. Manilal KS. Ethnobotany of the Rices of Malabar in Contribution to Ethnobotany of India. Scientific Publishers, Jodhpur, 1991, 243–253.
14. Nwanze KF, Mohapatra S, Kormawa P, Shellemiah K, Bruce-Oliver S. Rice development in sub-Saharan Africa. J Sci. Food Agric. 2006;68:675-677.
15. Olaf K, Emmanuel D. Global food security response: Ghana rice study. USAID micro-report 2009 No. 156.
16. Ransom JK, Paudyal K, Adhikari K. Adoption of improved maize varieties in the hills of Nepal. Agric Econ. 2003;29:299-305.
17. Singh KMP, Singh RP. Ginger cultivation in Himachal Pradesh. Indian FMG. 1967;30(11):25-26.
18. Thomas A, Kumar K. Technology Needs Assessment in the Homegarden Systems. J. Ext. Educ. 2015;27(4):5556-5563.
19. Zhou Z, Robards K, Helliwell S, Blanchard C. Composition and functional properties of rice. Int. J Food Sci. 2002;37:849-868.