A Study on Socio-economic Profile of Paddy Growers in Milkipur Block of Ayodhya District of Uttar Pradesh, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The study was conducted in five villages of Milkipur block in Ayodhya district, selected purposively based on proximity to the researcher and accessibility. A complete list of all paddy growers in each selected village was prepared. From this list, a total of 120 farmers were selected using a proportionate random sampling technique. The results of the study revealed that the majority of the respondents exhibited various socio-economic characteristics, such as being in the age category of

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39-62 years (61.67%), being literate (84.16%), belonging to the general caste (39.17%), living in nuclear families (85.83%), having a family size of 4-8 members (62.50%), being marginal farmers with land holdings below one hectare (43.33%), and having agriculture as their main occupation with subsidiary agricultural labor occupations (90.83% and 21.66%, respectively). A mixed housing pattern was observed in 56.66% of the respondents. In terms of material possessions, diesel engines (53.33%) and chaff cutters (85.83%) were the main farm power and agricultural implements, respectively. For transportation, bicycles (98.33%) were predominant. In terms of communication media, household materials such as coats (100%) and mobile phones (100%) were reported as main possessions. Additionally, 57.50% of respondents had no participation in any organizations. The majority of respondents (52.50%) reported an annual family income of up to 50,000. Gram pradhan (05.57%), family members (06.00%), and mobile phones (06.00%) were identified as the main formal, informal, and communicational sources of extension contact, respectively.

1. INTRODUCTION

"Rice (*Oryza sativa L.*) is one of the most important cereal grains in the world today and serves as a staple food source for more than half of the world's particularly in India, China and a number of other countries in Africa and Asia. It occupies an area of about 161 million hectares at global level with production of 503.8 million tonnes milled basis. More than 90% of the rice is produced and consumed in Asian countries". (Source: FAO United Nation 2017).

Rice provides 21 percent of global human per capita energy and 15% of per capita protein. Although rice protein ranks high in nutritional quality among cereals, protein content is modest. Rice also provides minerals, vitamins, and fiber, although all constituents except carbohydrates are reduced by milling [1-4].

"Rice commodity recognized as a supreme commodity to mankind, because rice is truly life, culture and tradition. It has its own history and religious importance in human life. India is one of the world's largest producers of white rice. For India, like many other developing countries, the issue of feeding ever increasing population is of prime importance, this problem can be solved by maximizing agricultural production through use of high yielding varieties and adopting improved package of practices of rice crop [5-8]. India is facing the challenges of food and fodder production to meet the demand of rising human and cattle population. One of the major causes of this problem is low level of adoption of improved agricultural practices by the farmers. Population" (Source:www.thecropsite.com)

There are three seasons for growing rice in India viz. autumn, winter and summer. The main rice growing season in the country is kharif. It is known as winter rice as per the harvesting time. The sowing time of kharif rice is June – July and it is harvested in September - October. India is an important centre of rice cultivation [9-12]. The rice is cultivated on the largest areas in India. Historians believe that while the indica variety of rice was first domesticated in the area covering the foothills of the Eastern Himalayas (i.e. North-Eastern India), stretching through Burma, Thailand, Laos, Vietnam and Southern China, while the japonica variety was domesticated from wild rice in Southern China which was introduced to India. Perennial wild rice still grows in Assam and Nepal [13-16].

"Among the paddy growing countries, India has the largest area under paddy in the world (45.50 million ha) with a total production of 111.01 million tons during 2017- 18 and it stood next only to China in the world with respect to production India has the world's largest area devoted to rice cultivation. Over half of its rice area is irrigated, contributing 75 per cent of the total production. Notably, this area also consumes 50-60 per cent of the nation's finite freshwater resources. Of the country's 1.15 billion inhabitants, 70% rely on rice for at least a third of their energy requirements. India's population is projected to grow to 1.6 billion in 2050, putting tremendous future strain on its land and water resources India provides around 21 per cent of global rice production from its 28 per cent of the world's rice area. Rice has shaped the culture, diets and economic of thousands of millions of peoples. For more than half of humanity, "rice is life". Considering its important position, the United Nations designated the year 2004 as the "International Year of Rice. Rice is a major food staple and a mainstay for the rural

population and their food security. India is an important center of rice cultivation". Source: (Indiastat.com).

"Rice is one of the most important crops in the Indo-Gangetic plain region of Uttar Pradesh. In India, rice is grown in almost half the states, with West Bengal leading the way in terms of production with 14.71 million tones, followed by Uttar Pradesh (12.22 million tons) and Andhra Pradesh (11.57 million tons) as per the" (Agricultural Statistics 2014-15, Ministry of Agriculture & Farmers Welfare of the Government of India).

"However, the low productivity is a concern for India since India's overall productivity, which lies at 2390 kg/ hectare, is less compared to the other countries, and there is a stark difference in India's states. Punjab, with a productivity of 3,838 kg/hectare, has the highest productivity in India, and Andhra Pradesh comes second with a productivity of 3,036 kg/hectare. The divergence shows in the form of Uttar Pradesh, which, despite being the second largest rice-producing state, has a productivity of 2,082 kg/ hectare, much less than the national average". (https://www.geographyandyou.com)

2. RESEARCH METHODOLOGY

The study was conducted in Ayodhya district of Uttar Pradesh, which has a sufficiently large area dedicated to rice cultivation, making it a purposive selection. Ayodhya district is situated in the eastern plain zone of Uttar Pradesh. Out of the 11 Community Development blocks in Ayodhya district, Milkipur block was purposively selected for this study due to its proximity to Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, and its convenient accessibility. Five villages were randomly selected within the block, resulting in a total sample size of 120 respondents involved in rice cultivation for this investigation. Data collection was designed and executed by interviewing a few respondents for pre-testing, followed by necessary modifications according to the study's requirements. Subsequently, data were collected from respondents through personal interviews. Statistical methods and analytical tools such as Percentage, Average, and Correlation coefficient were employed for measuring and analyzing the data in the study.

Statistical methods used:

1. Percentage (%): The frequency of a particular cell was divided by the total number of respondents or (MPS) in that particular category and multiplied by 100 for calculating the percentage.

2. Average ($\overline{X}$): The average ($\overline{X}$) was calculated by adding the total scores obtained by the respondents and divided it by the total number of respondents using the following formula:

$$(\overline{X}) = \frac{\sum X}{N}$$

Where,

$\overline{X}$ = Average or mean
$\sum X$ = Total number of scores obtained by respondents
N = Total number of respondents

3. Standard deviation (σ): S.D. is the square root of mean of the squares of all deviations, the directions being measured from the arithmetic mean of the distribution. It is commonly developed by symbol (σ).

$$\text{S.D. } (\sigma) = \frac{\sqrt{\sum d^2}}{n}$$

Where,

σ = Standard deviation
d = Deviation of variables mean
M = Total number of items

3. RESULTS AND DISCUSSION

1. Age composition:

It is evident from Table 1 that the highest number of respondents (61.67%) were observed in the age group of 39 to 62 years, with (20.00%) falling in the age group of up to 38 years and (18.33%) being aged 63 years and above.

2. Education:

Table 2 highlights that (84.16%) of respondents were literate, while (15.84%) were illiterate. Furthermore, the educational levels were categorized and presented in descending order as follows: (20.83%) middle and high school, (15.00%) primary, (14.16%) intermediate, (10.84%) graduate, and (02.50%) postgraduate. It can be concluded that the majority of respondents were literate.

Table 1. Distribution of respondents according to age

S.No.	Age Categories (years)	Respondents	
		No.	%
1.	Young (up to 38 years)	24	20.00
2.	Medium (39 to 62 years)	74	61.67
3.	Old (above 63 years)	22	18.33
Total:		**120**	**100.00**

Mean = 50.84, S.D. =12.48 , Min. =25 , Max. = 80

Table 2. Distribution of respondents according to education

S.No.	Categories	Respondents	
		No.	%
A.	Illiterate	19	15.84
B.	Litrate	101	84.16
1.	Primary	18	15.00
2.	Middle	25	20.83
3.	High school	25	20.83
4.	Intermediate	17	14.16
5.	Undergraduate	13	10.84
6.	Post graduate	03	02.50
Total:		120	100.00

Table 3. Distribution of respondents according to caste

S. No.	Categories	Respondents	
		No.	%
1.	General caste	47	39.17
2.	Backward caste	36	30.00
3.	Scheduled caste	37	30.83
Total:		**120**	**100.00**

3. Caste composition:

Table 3 shows that the highest number of respondents (39.17%) belonged to the general caste, followed by scheduled caste and backward caste with (30.83%) and (30.00%) respectively. Thus, it may be concluded that the general caste was dominant in the study area.

4. Family type:

Table 4 reveals that (85.83%) of respondents were observed residing in nuclear family systems, while (14.17%) were in joint families. Hence, it can be inferred that the nuclear family system dominates in the study area.

5. Family size:

Table 5 indicates that (62.50%) of respondents' families had 4 to 8 members, followed by (25%)

with up to 3 members and (15%) with 9 or more members. The average family size was 2.66 members, with the range varying from 2 to 15. The presence of a higher number of family members may be attributed to the dominance of the nuclear family system in the area.

6. Land holding:

Table 6. shows that the majority of respondents (43.33%) fell into the category of marginal landholders (less than 1 ha), followed by (22.50%) in the small category (1-2 ha), (20.83%) in the medium category (2-3 ha), and (13.33%) in the large category (above 3 ha). The average landholding per respondent was 1.57 hectares. Thus, it can be concluded that marginal farmers outnumbered others in the study area, likely due to land fragmentation resulting from family divisions.

Table 4. Distribution of respondents according to family type

S. No.	Categories	Respondents	
		No.	%
1.	Nuclear	103	85.83
2.	Joint	17	14.17
	Total:	120	100.00

Table 5. Distribution of respondents according to size of family

S. No.	Categories	Respondents	
		No.	%
1.	Up to 3 members	30	25.00
2.	4 to 8 members	75	62.50
3.	9 and above	15	12.50
Total:		120	100.00

Mean = 05.18,   S.D.=2.66,   Min.=02.00,   Max.=15.00

Table 6. Distribution of respondents according to land holding

S. No.	Categories	Respondents	
		No.	%
1.	Marginal (below 1.0 ha)	52	43.33
2.	Small (1.0 to 2.0 ha)	27	22.50
3.	Medium (2.0 to 4.0 ha)	25	20.83
4.	Large (4.0 & above)	16	13.33
Total:		120	100.00

Mean =01.57,   Min.= 0.30,   Max.= 6.00

Table 7. Distribution of respondents according to family occupation

S. No.	Categories	Respondents			
		Main occupation		Subsidiary occupation	
		No.	%	No.	%
1.	Agriculture labor	01	0.83	26	21.66
2.	Caste based occupation	01	0.83	02	01.66
3.	Service	05	04.16	0	0
4.	Agro-based enterprises	01	0.83	04	03.33
5.	Agriculture	109	90.83	11	09.16
6.	Business	03	02.50	13	10.83
7.	Other	0	0	02	01.66
Total:		120	100.00	58	48.30

7. Family occupation:

Table 7 clearly shows that agriculture was the primary occupation for the majority of respondents (90.83%), followed by service (4.16%), business (2.50%), and other occupations such as agriculture labor, caste-based occupation, and agro-based enterprises (0.83% each). Regarding subsidiary occupations, the highest percentage of respondents (21.66%) were engaged in agriculture labor, followed by business (10.83%), agriculture (9.16%), agro-based enterprises (3.33%), caste-based occupation, and others (1.66% each). Additionally, (51.66%) of respondents did not provide information on their subsidiary occupation.

8. Housing pattern:

The Table 8 revealed that majority of farmers have possessed mixed type of house (56.66%) followed by pucca (37.50%), kaccha (05.83%), respectively.

Table 8. Distribution of respondents according to housing pattern

S. No.	Categories	No.	Percentage
1.	Kaccha	07	05.83
2.	Mixed	68	56.66
3.	Pucca	45	37.50
	Total	**120**	**100**

Table 9. Distribution of the respondents on the basis of farm power

S. No.	Categories	Respondents	
		Number	Percentage
1.	Tractor	13	10.83
2.	Power tiller	03	02.50
3.	Diesel engine	64	53.33
4.	Electric motor	18	15.00
5.	Bullock	09	07.50
6.	Tube well/Pumping set	46	38.33

Table 10. Distribution of the respondents on the basis of agriculture implements

S. No.	Categories	Respondents	
		Number	Percentage
1.	Combine harvester	01	0.83
2.	Cultivator	13	10.83
3.	Seed drill	04	03.33
4.	Thresher	07	05.83
5.	Rotavator	09	07.50
6.	Winnower	19	15.83
7.	Chaff cutter	103	85.83
8.	Disc plough	11	09.16
9.	Deshi plough	05	04.16
10.	Pata	30	25.00

Note – More than one item have been shown by the respondents. Hence, the total percentage of all the items would be more than 100

Table 11. Distribution of the respondents on the basis of transportation

Materials:

S. No.	Categories	Respondents	
		Number	Percentage
1.	Truck	01	0.83
2.	Jeep	01	0.83
3.	Pick up	04	03.33
4.	Tractor Trolley	11	09.16
5.	Bike/Scooter	73	60.83
6.	Bullock cart	07	05.83
7.	Cycle	118	98.33
8.	Tempo	10	08.33
9.	Car	07	05.83

Note – More than one item have been shown by the respondents. Hence, the total percentage of all the items would be more than 100

9. Materials possession:

The Table 9. revealed that the majority of farmers (53.33%) was found having diesel engine followed by tube well (38.33%), electric motor (15.00%), tractor (10.83%), bullock (07.50%) and power tiller (02.50%), respectively.

10. Agriculture Implements Materials:

It is evident from the data in Table 10 that the majority of respondents (85.83%) reported owning a chaff cutter, followed by pata (25.00%), winnower (15.83%), deshi plough (04.16%), cultivator (10.83%), disc plough (09.16%), rotavator (07.50%), thresher (05.83%), seed drill (03.33%), and combine harvester (0.83%), respectively.

11.Transportation material possession:

Table 11. indicates that an overwhelming majority of the respondents (98.33%) reported owning a bicycle as a means of transportation, followed by a motor cycle (60.83%), tractor trolley (09.16%), tempo (08.33%), bullock cart and car (05.83% each), pick-up (03.33%), and jeep and truck (0.83% each), respectively. Thus, it can be inferred from the above data that bicycles were the most important means of transportation among the respondents.

12. Houses hold materials possession:

Table 12. indicates that all respondents reported owning cots, followed by pressure cookers (78.33%), gas stoves/gas cylinders, and fans (75.83% each), crockery (50.00%), heaters (32.50%), electric presses (30.83%), coolers (27.50%), sofa sets, dining tables, and washing machines (11.66% each), solar lights, and sewing machines (10.83% each), dressing tables (10.00%), double beds (5.00%), and induction cookers (2.50%). The condition of household materials appears to be good.

13. Communication media possession:

Table 13. revealed that all respondents reported owning a mobile phone, followed by radios (82.50%), TVs (50.00%), DTH (35.00%), internet (27.50%), V.C.D players (11.66%), agriculture journals (06.66%), agriculture books (05.00%), and journal magazines (03.33%), respectively.

14. Social participation:

Table 14. indicates that the majority of respondents had no participation in any organizations (57.50%), followed by participation in one organization (20.83%), participation in two organizations (14.16%), and participation in more than two organizations (07.50%), respectively. Thus, (57.50%) of farmers reported having no participation in any organizations.

15. Annual family income:

Table 15. shows that (52.50%) of respondents were from families with an annual income in the category of up to 50,000 rupees, followed by other categories such as 50,001-100,000 rupees (40.83%) and above 100,001 rupees (06.66%). The average income was observed to be 56,962.50 rupees, with a range from a minimum of 20,000 rupees to a maximum of 640,000 rupees. Only 4 members were below the poverty line, which is pegged at about 27,000 rupees annually. Hence, it can be concluded that the respondents had a considerably good economic condition.

16. Extent of contact with information sources:

The data presented in Table-16 pertains to the extent of contentment of respondents with different information sources used for receiving general information as well as about various practices of paddy cultivation. Information sources were categorized into three categories: formal sources, informal sources, and mass media exposure, to assess the extent of contact of respondents. In terms of contact with formal sources, gram pradhan, fertilizer/seed store, cooperative societies, kisan sahayak, mandi samiti, V.D.O., agricultural college/university, A.D.O., B.D.O., and agricultural scientists obtained rank orders I to X, respectively. The mean score for all formal sources was found to be 02.83. For contact with informal sources, family members and friends both ranked I, neighbors, progressive farmers, relatives, and local leaders were ranked II to V, respectively, with a mean score of 04.55 for Communication media exposure/Contact, mobile phones, radios, TVs, news bulletins, internet, posters, newspapers, film shows, demonstrations, farmers fairs, exhibitions, farm magazines, agricultural books, folders, and circular letters were ranked I to XV, respectively, with a mean score of 03.38 for mass media exposure.

Hence, it can be concluded that informal sources of information appeared to be most important, as they were generally utilized by most respondents. Formal and mass media information sources were also utilized by respondents to a considerable extent. The overall mean score for formal, informal, and mass media information sources was found to be 03.38, which may be considered

as fair contact with information sources.

Scientific orientation:

It is evident from Table 17 that (14.16%) of the respondents were found to have a low level of scientific orientation, followed by medium (68.33%) and high (17.50%) levels, respectively. The mean score for scientific orientation was observed to be 22.59, with a range from a minimum of 20 to a maximum of 28. Therefore, it can be inferred that the majority of respondents exhibited a medium level of scientific orientation.

Table 12. Distribution of the respondents on the basis of household materials

S. No.	Categories	Respondents	
		Number	Percentage
1.	Double bed	06	05.00
2.	Sofa set	14	11.66
3.	Dining Table	14	11.66
4.	Dressing Table	12	10.00
5.	Gas stove/Gas cylinder	91	75.83
6.	Electric press	37	30.83
7.	Washing machine	14	11.66
8.	Pressure cooker	94	78.33
9.	Crockery	60	50.00
10.	Fan	91	75.83
11.	Cooler	33	27.50
12.	Solar light	13	10.83
13.	Heater	39	32.50
14.	Cots	120	100.00
15.	Induction cooker	03	02.50
16.	Sewing machine	13	10.83

Note- More than one item have been shown by the respondents. Hence, the total percentage of all the items would be more than 100

Table 13. Distribution of the respondents on the basis of communication media possession

S. No.	Categories	Respondents	
		Number	Percentage
1.	T.V.	60	50.00
2.	Radio	99	82.50
3.	Mobile	120	100.00
4.	Agril. Journals	08	06.66
5.	Agricultural Magazines	06	05.00
6.	D.T.H.	42	35.00
7.	Journal Magazines	04	03.33
8.	Agriculture Books	06	05.00
9.	News paper	06	05.00
10.	Internet	33	27.50
11.	VCD player	14	11.66

Note: - More than one item have been shown by the respondents. Hence, the total percentage of all the items would more than 100

Table 14. Distribution of the respondents on the basis of social participation

S.No.	Participation	Respondents	
		Number	Percentage
1.	No Participation	69	57.50
2.	Participation in one organization	25	20.83
3.	Participation in two organization	17	14.16
4.	Participation in more than two organizations or office bearer	09	07.50
	Total	**120**	**100**

Table 15. Distribution of respondents according to annual family income

S. No.	Categories (Rs.)	Respondents	
		No.	%
1.	(Up to 50000)	63	52.50
2.	(50001to100000)	49	40.83
3.	(100001and above)	08	06.66
Total		**120**	**100.00**

Average = 56962.50,   Min. Rs. = 20000,   Max. = 640000

Table 16. Distribution of the respondents on the basis of extent of contact with different information sources

S. No.	Categories of information sources	Mean score value	Rank order
A. Formal sources			
1.	B.D.O.	01.06	IX
2.	A.D.O.	01.15	VIII
3.	V.D.O.	02.38	VI
4.	Kisan sahayak	03.55	IV
5.	Gram Pradhan	05.57	I
6.	Cooperative societies	04.11	III
7.	Agril. College/ University	01.80	VII
8.	Mandi samiti	03.44	V
9.	Fertilizer / Seed store	04.98	II
10.	Agril. Scientist	0.35	X
	Average	**02.83**	
B. Informal sources			
1.	Family members	06.00	I
2.	Neighbor	05.74	II
3.	Friends	06.00	I
4.	Relatives	02.96	IV
5.	Local leaders	01.81	V
6.	Progressive farmers	04.81	III
	Average	**04.55**	
C. Communication media exposure/Contact			
1.	Radio	05.96	II
2.	T.V.	05.81	III
3.	News paper	04.76	VII
4.	Agril. Books	0.87	XIII
5.	News bulletin	05.63	IV
6.	Farm magazines	0.96	XII
7.	Circular letter	0.21	XV
8.	Poster	04.86	VI
9.	Farmers fair	01.27	X
10.	Mobile	06.00	I
11.	Exhibition	01.16	XI
12.	Internet	05.05	V
13.	Film show	03.90	VIII
14	Demonstration	02.15	IX
15	Folders	0.72	XIV
	Average	**03.28**	
	Over all mean	**03.38**	

Table 17. Distribution of respondents according to scientific orientation N=120

S.No.	Categories (score)	Respondents	
		No.	%
1.	Low(up to 20)	17	14.16
2.	Medium (21 to 24)	82	68.33
3.	High (above 25)	21	17.50
Total		**120**	**100.00**

Mean = 22.59, S.D. = 02.51, Min. = 20, Max. = 28, All possible scores- 30

Table 18. Distribution of respondents according to economic motivation N=120

S.No.	Categories (scores)	Respondents	
		No.	%
1.	Low (upto 20)	22	18.33
2.	Medium (21-25)	85	70.83
3.	High (above 25)	13	10.83
Total		**120**	**100.00**

Mean = 22.61, S.D. = 01.79, Min. = 20, Max. = 26, All possible scores- 30

Table 19. Distribution of respondents according to risk orientation N=120

S.No.	Categories (scores)	Respondents	
		No.	%
1.	Low (upto 17)	24	20.00
2.	Medium (18 to 24)	64	53.33
3.	High (above 24)	32	26.66
Total		**120**	**100.00**

Mean = 21.23,   S.D. = 03.54, Min. = 17, Max. = 27, All possible scores- 30

Economic motivation:

It is apparent from Table 18 that (70.83%) of the respondents were found to have a medium level of economic motivation, whereas (18.33%) and (10.83%) of respondents had low and high levels of economic motivation, respectively. The mean score for economic motivation was observed to be 22.61, with a range from a minimum of 20 to a maximum of 26. Hence, it can be concluded that the majority of respondents were found to have a medium level of economic motivation.

Risk orientation:

It is apparent from Table 19 that (53.33%) of the respondents were found to have a medium level of risk orientation, followed by (20.00%) and (32.00%) who had low and high levels, respectively. The mean score for risk orientation was observed to be 21.23, with a range from a minimum of 17 to a maximum of 27. Hence, it can be concluded that the respondents have a medium interest in bearing the risk relating to improved farming.

4. CONCLUSION

The study results reveal various socio-economic characteristics of the respondents. The majority of respondents fall within the age category of 39-62 years (61.67%), are literate (84.16%), belong to the general caste (39.17%), reside in nuclear families (85.83%), and have a family size of 4-8 members (62.50%). Additionally, a significant proportion of respondents are marginal farmers with land holdings below one hectare (43.33%). Agriculture is identified as the main occupation for most respondents (90.83%), with subsidiary agricultural labor occupations also prevalent (21.66%). Furthermore, a mixed housing pattern is observed among respondents (56.66%).Regarding material possessions, the majority of farmers own essential farming equipment such as diesel engines (53.33%) and chaff cutters (85.83%). Additionally, transportation materials such as bicycles (98.33%) are widely possessed. Household items including coats (100%) and mobile phones (100%) are reported as the main communication media possessions. Participation in organizations is limited, with 57.50% of respondents indicating

no participation in any organizations. In terms of annual family income, the maximum number of respondents fall within the category of up to 50,000 rupees (52.50%). Gram pradhans (05.57%), family members (06.00%), and mobile phones (06.00%) are identified as the main formal, informal, and communicational sources of extension contact, respectively. The majority of respondents (68.33%) were in the medium level of scientific orientation, followed by high (17.5%) and low (14.16%), respectively. Similarly, the majority of respondents (70.83%) were in the medium level of economic motivation, followed by low (18.33%) and high (10.83%), respectively. Additionally, the majority of respondents (53.33%) were in the medium level of risk orientation, followed by high (26.66%) and low (20%), respectively. These conclusions provide insights into the socio-economic profile and communication patterns of the respondents, which are crucial for understanding their needs and behaviors in the context of agricultural extension and development efforts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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