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Information processing behavior of pea growers and its association with selected independent variables

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ABSTRACT
Information processing behavior refers to the handling and curtailing of information received according to the needs of the receivers or it is all that is done to the received information before it is put to actual use. The aim of this research was to investigate how pea farmers gather, interpret, and use agricultural information to inform their decision-making processes. The study was conducted in two specifically chosen districts, Sultanpur and Bhadohi in Uttar Pradesh. The study employed a random sampling method to select two blocks from each district Lambhua and Kurebhar from Sultanpur, and Gyanpur and Suriyawan from Bhadohi. A list of major pea-growing villages was compiled with input from the Revenue and Agriculture departments of these blocks. Subsequently, 20 villages (5 from each block) were randomly chosen. Within each village, 20 respondents were selected using simple random sampling, resulting in a total of 200 farmers per district and 400 respondents overall. The research utilized an *ex-post facto* research design, focusing on variables that were predetermined and not manipulated during the study. Data were collected using a pre-structured interview schedule. It was found that key methods such as evaluating information from experience and discussing with peers were prominent. Information was commonly stored through memorization and shared within family and social networks, influenced by factors like age, education, and occupation. Overall, the study highlights diverse strategies and influential factors in the information behaviors of pea growers.

Keywords: Information processing, decision-making, ex-post facto etc.

INTRODUCTION

The behaviorist movement had a considerable influence on psychology in the first half of the twentieth century. Behaviorists held that the human mind was inaccessible to scientific

investigation and that observed behavior was the only credible source of data in psychology. They claimed that human behavior was the consequence of habit and conditioning, with environmental stimuli eliciting typical reactions **(Watson, 1913).** This method dominated psychology for decades, but it was limited in its capacity to describe complicated cognitive processes. Cognitive psychologists began to react against behaviorism in the 1950s, offering a new method that focused on the flow of information through the brain during cognitive activities **(Miller, Galanter, & Pribram, 1960).**

The information processing was founded on the notion that mental processes can be understood by examining how information is input, processed, and output by the brain **(Atkinson & Shiffrin, 1968).** The information processing method arose as a response to behaviorism, which focused primarily on observable behaviors and overlooked internal mental processes **(Eysenck & Keane, 2015).** However, the failure of behaviorism to account for mental processes such as perception, attention, and memory gave rise to the information processing **(Eysenck and Keane, 2015).** According to the information processing method, information goes through several stages, including input, processing, and output **(Sternberg 2012).**

This method argues that studying how the brain processes information will help us understand cognitive functions like attention and memory **(Sternberg, 2012).** Working memory, language, and memory have all been studied through the lens of information processing. Memory is one of the main topics of research for the information processing technique. Three stages of memory are proposed by the information processing approach: sensory memory, short-term memory, and long-term memory **(Atkinson & Shiffrin, 1968).** Only a small percentage of the sensory information stored in sensory memory gets moved to short-term memory **(Baddeley, 2003).** Sensory memory retains information from the senses for a short while.

Information must be practiced in order to go from short-term memory—which has a limited capacity and duration—to long-term memory **(Baddeley, 2003).** Information is stored in long-term memory for longer periods of time and has an infinite capacity and longevity **(Baddeley, 2003).** The theory of information processing has also been used with language. This method holds that language is processed in a manner akin to that of other kinds of information. For instance, meaning is initially extracted from language, followed by processing it to produce a response **(Levelt, 1989).** Language comprehension, production, and acquisition have all been studied using the information processing method **(Levelt, 1989).**

Finally, working memory has been studied using the information processing method. Information is kept in working memory, a system of temporary storage, while it is being processed **(Baddeley, 2012).** According to the information processing method, working memory is subject to distraction and interference and has a finite capacity **(Baddeley, 2012).** In general, the information processing approach which suggests that information moves through several stages emerged in reaction to behaviorism's drawbacks. A theoretical framework known as the information processing explains how information is gathered, processed, and stored in the human mind **(Baddeley & Hitch, 1974).** This method compares the functioning of the human mind to that of a computer, which takes input, processes it, and outputs the results. The information processing has been used to study working memory, language, and memory in a variety of cognitive psychology contexts **(Miller, 1956).**

Information processing behavior is the management and adaption of received information to fulfill the needs of the receivers, and it includes cognitive processes such as attention, perception, memory, and decision-making, which are influenced by psychological, social, and environmental factors. It investigates how people collect data from their surroundings, convert it

into useful formats, store it for later use, and use it to make judgments and decisions. This concept is critical across fields like as psychology, education, and marketing, as it provides insights into human cognition, behavior development, and the effectiveness of communication and information sharing initiatives. **(Anonymous, 2020)**

1.2 Research problem

This research aims to analyze the information processing behavior of pea farmers, focusing on understanding how they gather, interpret, and utilize agricultural information to make decisions. The information processing behavior of farmers was studied under three major modes i.e. information evaluation methods, information storage methods and information transfer methods. Specifically, the study seeks to investigate the following key questions such as what sources of agricultural information do pea farmers rely on, How do pea farmers process and evaluate the credibility of the information they receive, what factors influence pea farmers' decision-making based on the information they acquire, are there differences in information processing behavior among pea farmers based on factors such as age, experience, or access to technology, what implications do the information processing behaviors of pea farmers have for agricultural extension services and policy makers. By addressing these questions, the research intends to provide insights into the cognitive processes involved in information utilization among pea farmers, aiming to enhance understanding of their decision-making dynamics and inform strategies for improving agricultural support systems.

2. Research methodology

2.1 Study area

The study was conducted in two specifically chosen districts, Sultanpur and Bhadohi in Uttar Pradesh. These districts were selected because Sultanpur is known for its high vegetable pea production while Bhadohi has the lowest production in the eastern Uttar Pradesh region throughout the year. From each district, two blocks were selected: Lambhua and Kurebhar from Sultanpur, and Gyanpur and Suriyawan from Bhadohi, using random sampling. A comprehensive list of major pea-growing villages was compiled with input from the Revenue and Agriculture departments of these blocks. From this list, 20 villages (5 from each block) were randomly chosen for the study. Within each village, 20 respondents were selected using simple random sampling, resulting in a total of 200 farmers per district, making up 400 respondents overall. The study utilized an ex-post facto research design, focusing on variables that had already occurred and were not subject to manipulation. Data were collected using a pre-structured interview schedule.

2.2 Data collection

Data were collected using a pre-structured interview schedule. An interview schedule was developed for this purpose, categorized into three main sections based on modes of information processing, each with detailed sub-questions. Respondents' answers were recorded on a three-point scale: always, sometimes, and never.

2.3 Formula used

2.3.1 The data analysis involved calculating mean percent scores, applying z-tests, and determining critical differences.

$$\textbf{Mean Percent Score (MPS)} = \frac{\textit{Total score obtained by respondents}}{\textit{Maximum obtained score}} \times 100$$

2.3.2 'Z' test (Standard Normal Deviate Test)

This test was used to observe significant difference between two sample mean for large sample (*i.e.* n > 30). Formula for 'Z' test is as under:

$$Z = \frac{|X_1 - X_2|}{\sqrt{\frac{S_1^2}{n_1^2} + \frac{S_2^2}{n_2^2}}}$$

Where,

X_1: Mean of first sample, X_2: Mean of second sample, S_1: Standard deviation of first sample, S_2: Standard deviation of second sample, n_1: Size of the first sample, n_2: Size of the second sample

This test was used to see the significant difference between pea growers of Sultanpur and Bhadohi district about information processing behavior.

2.3.3 Correlation coefficient (r):

In order to know the relationship between any two variables, correlation test is frequently applied. The correlation coefficient (r) is a measure of a degree of closeness of the linear relationship between the two variables.

3. RESULT AND DISCUSSION

The study gathered responses from 400 pea farmers to assess their information processing behavior. Here is a summary of the findings for each categories.

3.1 INFORMATION PROCESSING BEHAVIOR OF THE PEA GROWERS

3.1.1 Distribution of Respondents on The Basis of Their Information Processing Behavior Regarding Improved Pea Cultivation Practices

The data from Table 3.1.1 reveals that in Sultanpur district, 51.50% of the 200 respondents exhibited a moderate level of overall information processing behavior, while 31.50% showed low levels, and only 17.00% demonstrated high levels. Similarly, in Bhadohi district, 54.50% of respondents displayed medium levels of overall information processing behavior, with 27.00% showing low levels, and 18.50% showing high levels. The majority of farmers fell into the category of medium information processing behavior, likely because they tend to have moderate educational qualifications, smaller land holdings, and are less inclined to adopt innovations.

Table 3.1.1: Distribution of respondents according to their information processing behavior about pea production technology

n=400

S. No.	Category	Respondents				
		Sultanpur		Category	Bhadohi	
		f	%		*f*	%
1.	Low (up to 25)	63	31.50	Low (up to 27)	54	27.00
2.	Medium (26-31)	103	51.50	Medium (28-32)	109	54.50
3.	High (32 & above)	34	17.00	High (33 & above)	37	18.50
	Total	**200**	**100.00**	**Total**	**200**	**100.00**

***f* = Frequency, % = per cent**

Mean: 28.41, S.D: 3.21, Min: 22, Max: 39 (Sultanpur) Mean: 29.59, S.D: 2.95, Min: 22, Max: 38 (Bhadohi)

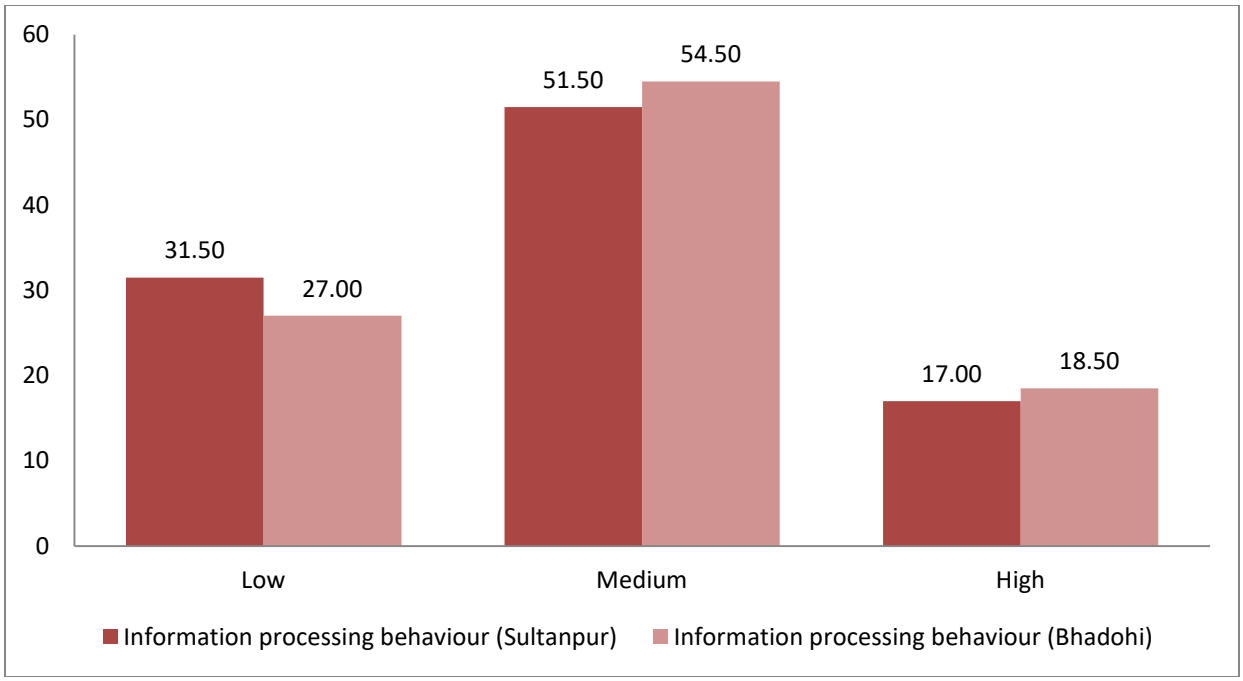

Fig 3.1.1: Distribution of respondents according to their information processing behavior about pea production technology

The results align with **Pramilla (1992)** who found that most respondents exhibited a moderate level of information processing behavior. In contrast**, Paul (2004)** reported a majority of respondents showing a high degree of information processing behavior, which contradicts the current findings.

3.2 Extent of Information Processing Behavior of Farmers Regarding Pea Production Technology

3.2.1 Information evaluation methods used by the pea growers

The data from Table 3.2.1 reveals that among the pea growers in Sultanpur, out of 200 respondents, the information received was extensively discussed with family members, friends, fellow farmers, progressive farmers, and neighbors, ranking highest at 71.94 MPS. Similarly, evaluating the merit of an innovation based on past experience ranked second at the same score of 71.94 MPS. Evaluating information based on climatic conditions ranked third at 71.44 MPS. Accepting information with modifications ranked fourth at 68.07 MPS, while accepting information as-is ranked fifth at 67.20 MPS. Judging based on technical feasibility ranked sixth at 66.45 MPS, and judging based on economic feasibility ranked seventh at 66.33 MPS. A smaller number of farmers discussed with officials from the State Department of Agriculture/Agriculture University, ranking eighth at 64.96 MPS. In conclusion, the methods used by pea growers in Sultanpur to evaluate information ranged from 64.96% to 71.94%.

Table 3.2.1 Information evaluation methods used by the pea growers

S. No.	Information evaluation method	Parameter					
		Sultanpur		Bhadohi		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Discussion with officials of State Department of Agriculture/ Agriculture University	64.96	VIII	66.76	VIII	65.86	VIII
2.	Acceptance of received information with modification	68.07	IV	78.45	V	73.26	V
3.	Judgment on the basis of economic feasibility	66.33	VII	**82.11**	**II**	74.22	IV
4.	Acceptance of received information as such	67.20	V	75.66	VI	71.43	VI
5.	Discuss with family members, friends, fellow farmers, progressive farmers and neighbours	**71.94**	**I**	**81.64**	**III**	**76.79**	**II**
6.	Judgment in the light of climatic conditions	**71.44**	**III**	79.27	IV	**75.35**	**III**
7.	Judgment based on technical feasibility	66.45	VI	69.67	VII	68.06	VII
8.	Weigh the merit of an innovation in the light of past experience	**71.69**	**II**	**84.72**	**I**	**78.20**	**I**

MPS = Mean Percent Score

Further examination of the data regarding pea growers in Bhadohi district shows that out of 200 respondents, the method of weighing the merit of an innovation based on past experience ranked first with a score of 84.72 MPS. Judging based on economic feasibility ranked second at 82.11 MPS, while discussing information with family members, friends, fellow farmers, progressive farmers, and neighbors ranked third at 81.64 MPS. Evaluating information in light of climatic conditions ranked fourth at 79.27 MPS. Accepting information with modifications ranked fifth at 78.45 MPS, and accepting information as-is ranked sixth at 75.66 MPS. Judging based on technical feasibility ranked seventh at 69.67 MPS, and discussing with officials from the State Department of Agriculture/Agriculture University ranked eighth at 66.76 MPS. Similar findings were also noted by **Meena (2014).**

3.2.2 Information storage methods used by the pea growers

The data from Table 3.2.2 reveals that among pea growers in Sultanpur, out of 200 respondents, conveying information to family members and asking them to remember it ranked first with a score of 73.44 MPS. Gathering information from social networks ranked second at 70.69 MPS, while memorizing the information ranked third at 70.57 MPS. Maintaining a subject matter file ranked fourth at 68.95 MPS, and keeping classified notebooks/diary ranked fifth at 68.70 MPS. Preserving information in the form of printed literature ranked sixth at 67.95 MPS. It was noted during the data collection period that many farmers faced time constraints due to farm and household responsibilities. This likely influenced the majority of respondents to store information by conveying it to family members.

Table 3.2.2 Information storage methods used by the pea growers

S. No.	Information storage methods	Parameter					
		Sultanpur		Bhadohi		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Conveying to family members and asking them to remember	**73.44**	**I**	**80.45**	**III**	76.945	**II**
2.	By maintaining classified notebooks/ diary	68.70	V	79.54	IV	74.12	IV
3.	Preservation in the form of printed literature	67.95	VI	76.23	V	72.09	V
4.	By maintaining subject matter file	68.95	IV	74.33	VI	71.64	VI
5.	Memorizing the information	**70.57**	**III**	**84.76**	**I**	77.665	**I**
6.	Gathering information from social system	**70.69**	**II**	**81.12**	**II**	75.905	**III**

MPS = Mean Percent Score

Further examination of the data concerning pea growers in Bhadohi reveals that out of 200 respondents, the most common method of storing information was through memorization, ranking first with a score of 84.76 MPS. Gathering information from social networks ranked second at 81.12 MPS, while conveying information to family members and asking them to remember it ranked third at 80.45 MPS. Maintaining classified notebooks/diary ranked fourth at 79.54 MPS, and preserving information in the form of printed literature ranked fifth at 76.23 MPS. Maintaining a subject matter file ranked sixth at 74.33 MPS.

3.2.3 Information transfer methods used by the pea growers

The data from Table 3.2.3 shows that among pea growers in Sultanpur, out of 200 respondents, the most common ways of sharing received information were transferring it to friends, fellow farmers, progressive farmers, and neighbors, ranking first with a score of 72.94 MPS. Sharing information with relatives ranked second at 71.81 MPS, while conducting demonstrations to illustrate practical aspects of the information ranked third at 70.44 MPS. Speaking in local meetings ranked fourth at 69.07 MPS, while sharing information with those seeking it ranked fifth at 68.87 MPS. Sharing with those who lease their land ranked sixth at 67.23 MPS, and lending printed literature to others ranked seventh at 66.70 MPS.

These findings align with those of **Pramilla (1992)** and **Ramasubramanian and Manoharan (2003),** who found that most respondents shared the received information with their friends, fellow farmers, and neighbors.

Table 3.2.3 Information transfer methods used by the pea growers

S. No.	Information transfer methods	Parameter					
		Sultanpur		Bhadohi		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Those who come to seek	68.87	V	76.76	III	**72.81**	**III**
2.	To friends, fellow farmers, progressive farmers and neighbours	**72.94**	**I**	**77.15**	**II**	**75.045**	**I**
3.	To relatives	**71.81**	**II**	**78.27**	**I**	**75.04**	**II**

4.	To those who cultivate their land on lease	67.23	VI	73.66	IV	70.44	IV
5.	Speaking in local meetings	69.07	IV	69.87	V	69.47	V
6.	By conducting demonstrations to show the practical aspect of received information	**70.44**	**III**	68.34	VI	69.39	VI
7.	Lending printed literature to others	66.70	VII	67.69	VII	67.19	VII

MPS = Mean Percent Score

Further analysis of the data from Table 3.2.3 regarding pea growers in Bhadohi reveals that among 200 respondents, the most common method of transferring received information was to relatives, ranking first with a score of 78.27 MPS. Sharing information with friends, fellow farmers, progressive farmers, and neighbors ranked second at 77.15 MPS, while sharing with those seeking information ranked third at 76.76 MPS. Transferring information to those who lease their land ranked fourth at 73.66 MPS, and speaking in local meetings ranked fifth at 69.87 MPS. Conducting demonstrations to illustrate the practical aspects of received information ranked sixth at 68.34 MPS, and lending printed literature to others ranked last, seventh, at 67.69 MPS. Similar findings were also reported by **Meena (2014).**

3.3 Overall Information Processing Behavior of Pea Growers

To get an overview of information processing behavior of pea growers, the overall score for each category was pooled and results have been presented in Table 3.3

Table 3.3: Overall information processing behavior of the pea growers

n=400

S. No.	Information processing behavior	Sultanpur		Bhadohi		Total	
		Mean	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**
1.	Information evaluation methods	68.51	**III**	77.28	**II**	72.89	**II**
2.	Information storage method	70.05	**I**	79.40	**I**	74.72	**I**
3.	Information transfer methods	69.58	**II**	73.10	**III**	71.34	**III**
	Pooled	**69.38**		**76.59**		**72.98**	

MPS = Mean Per cent Score

The data from Table 3.3 indicate that among the different information processing modes considered, pea growers utilized information storage methods the most, with a mean of 74.72. Following closely were information evaluation methods, which had a mean of 72.89. In contrast, information transfer methods were the least utilized among the pea growers, with a mean of 71.34. Similar findings were also reported by **Meena (2014).**

3.4 Comparison of information processing behavior between pea growers of Sultanpur and Bhadohi

The results of applying the 'Z' test to examine the difference in information processing behavior between pea growers from Sultanpur and Bhadohi districts regarding pea cultivation technology are presented in Table 3.4.

Hypothesis

H_0: There is no significant difference between pea growers of Sultanpur and Bhadohi about information processing behavior of pea cultivation technology.

H_1: There is significant difference between pea growers of Sultanpur and Bhadohi about information processing behavior of pea cultivation technology.

Table 3.4: Significance of difference about information processing behavior of pea growers

S. No.	District of pea growers	Mean	S.D.	'Z' value
1.	Sultanpur	69.30	2.38	**9.35****
2.	Bhadohi	73.24	5.57	

*** Significant at 5 per cent level**

Table 3.4 indicates that the calculated 'Z' value exceeded its tabulated value at the 5% significance level. Therefore, the null hypothesis (H_0) was rejected, and the alternative hypothesis (H_1) was accepted. This suggests a significant difference in information processing behavior between pea growers of Sultanpur and Bhadohi districts regarding pea cultivation technology.

The mean values suggest that pea growers in Bhadohi exhibited higher levels of information processing behavior concerning pea cultivation technology compared to those in Sultanpur district. This difference in information processing behavior among pea growers could be attributed to factors such as higher literacy rates, greater innovativeness, stronger scientific orientation, increased contact with agricultural extension services, greater risk-taking propensity, and a more cosmopolitan perspective among pea growers in Bhadohi, as opposed to those in Sultanpur district. Similar findings were also reported by **Meena (2014).**

Mean value table

S. No.	Name of districts	Mean value	C.D. value
1.	Sultanpur	69.30	**3.94**
2.	Bhadohi	73.24	

Upon comparing the mean value with the Critical Difference (C.D.) value, a significant difference was observed between pea growers of Sultanpur and Bhadohi districts. Pea growers from Bhadohi district demonstrated higher levels of information processing behavior compared to those from Sultanpur district.

3.5 ASSOCIATION BETWEEN PERSONAL VARIABLES AND INFORMATION PROCESSING BEHAVIOR LEVEL OF PEA PRODUCTION TECHNOLOGY BY THE FARMERS

This section examines the relationship between the level of information processing behavior among pea growers and their independent variables. To explore this relationship, the coefficient of correlation was used.

Table 3.5.1 Distribution of respondents according to their correlation coefficient between different variables and information processing behavior level.

S. No.	Variables	''r'' value (Sultanpur)	''r'' value (Bhadohi)
1.	Age	0.573**	0.561**
2.	Caste	0.075^{NS}	0.071^{NS}
3.	Housing pattern	0.324**	0.334**
4.	Gender	0.268**	0.254**
5.	Religion	0.190*	0.189*
6.	Education	0.296**	0.286**
7.	Occupation	0.460**	0.441**
8.	Annual Income of Family	0.192*	0.189*
9.	Social Participation	0.385**	0.318**
10.	Marital Status	0.073^{NS}	0.061^{NS}

11.	Land holding	0.377**	0.411**
12.	Irrigation sources	0.571**	0.512**
13.	Family type	0.309**	0.311**
14.	Family size	0.381**	0.374**
15.	Innovativeness	0.431**	0.498**
16.	Scientific orientation	0.698**	0.653**
17.	Economic motivation	0.238*	0.231*
18.	Extension Contact	0.441**	0.471**
19.	Risk orientation	0.383**	0.321**
20.	Cosmopolitan outlook	0.284**	0.261**

***Significant at 0.05% probability level, **Significant at 0.01% probability level, NS: Non significant**

Table 3.5.1 indicates that in both Sultanpur and Bhadohi districts, several key factors significantly correlated with the information processing behavior among pea growers. These factors included age, housing pattern, gender, education level, occupation, social participation, land holding size, irrigation sources, family type, family size, innovativeness, scientific orientation, extension contact, risk orientation, and cosmopolitan outlook. These variables consistently showed positive associations with higher levels of information processing behavior. Conversely, variables such as caste and marital status did not exhibit significant correlations with information processing behavior. Variables like religion, annual income, and economic motivation were less significant but still demonstrated positive correlations, suggesting that higher values of these variables were associated with increased levels of information processing behavior among pea growers.

CONCLUSION

It is concluded that based on the data from Sultanpur and Bhadohi districts among pea growers, several key methods and behaviors for evaluating, storing, and sharing information emerge prominently. Evaluating information based on past experience and discussing with peers are consistently high-ranking methods. Storing information through memorization and sharing it with family and friends are prevalent practices. These behaviors are influenced by factors such as age, education, occupation, and social participation, which positively correlate with higher levels of information processing. Notably, variables like caste and marital status show no significant correlation. Overall, these findings highlight the diverse strategies and influential factors shaping information behaviors among pea growers in the study area.

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