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FACTORS AFFECTING FARMERS' KNOWLEDGE REGARDING ORGANIC FARMING PRACTICES

Chandrika Sharma[1*], Sonam Agrawal[2] and Varsha More[3]

1 Lab Technician, Department of Extension Education, College of Agriculture, JNKVV, Jabalpur - 482004
2 Asstt. Professor, Department of Extension Education, College of Agriculture, JNKVV, Jabalpur - 482004
3 Ph.D. Res. Scholar, Department of Extension Education, College of Agri., JNKVV, Jabalpur - 482004
Email : chandrikasharma1991@gmail.com

ABSTRACT

In contemporary times, organic agricultural methodologies stand as the sole remedy for the pervasive issues of soil contamination, compromised crop quality, environmental degradation and human health concerns, offering a pathway towards enduring sustainability. This research investigates the relationship between various variables and the knowledge levels of farmers engaged in organic and non-organic agricultural practices in Jabalpur district. Among twenty eight variables examined, area under organic farming, risk orientation, innovativeness, trainings received on organic farming, experience in organic farming, environment orientation, attitude towards organic farming practices, relative advantages, compatibility, trialability and observability of organic farming practices, farm size, social participation, livestock possession, mass media exposure, information sources, market perception and decision making had positively significant relation with the knowledge of farmers practicing organic farming. Conversely, factors such mass media exposure, information sources, scientific orientation, risk orientation, attitude towards organic farming, market perception, innovativeness, trainings received on organic farming and environment orientation showed positive and significant relationships with the knowledge of farmers practicing non-organic farming. These findings suggest that different variables play key roles in influencing the knowledge levels of farmers in different agricultural practices, providing valuable insights for stakeholders involved in policy-making and promotion of organic farming initiatives.

Keywords: *knowledge, non-organic, organic, relationship, variables.*

INTRODUCTION

The growing awareness about human health and environmental issues relating to agrochemicals' use in agriculture has led to interest in alternate forms of sustainable agriculture. Scientists have recognized that the Green Revolution, characterized by intensive input usage, has attained a plateau, manifesting diminishing returns and dwindling dividends. To meet the demand of increasing population, farmers attract towards the use of more and more chemicals in order to gain higher (Korat, et. al. 2022). The indiscriminate application of chemical fertilizers and pesticides presents a looming peril to soil integrity and environmental equilibrium (Sharma, et.al. 2024). In fact, about 60 per cent of our agricultural land currently under cultivation suffers from indiscriminate use of irrigation water and chemical fertilizers (Darandale & Soni, 2011). It is imperative to uphold a natural equilibrium to ensure the sustenance of life and prosperity. Accordingly, the reintroduction of organic farming stands as a compelling solution, allowing for the preservation of agricultural productivity without compromise (Jaganathan, et. al. 2009). It is a holistic way of farming in which quality agricultural production is achieved with an aim to conserve, rather improve, natural resources whereas conventional or modern farming, on the other hand, is more akin to the factory farming which gives emphasis on input-based maximization of crop productivity (Sharma, et.al. 2022). Organic farming is thought to be originated in Asia where agriculture was not just a profession but a way of life. The demand for organic food products is growing due to high purchasing power and increase in health-conscious consumers (Sharma, et. al. 2022). Despite comprising a marginal fraction of overall agricultural output in India, organic agriculture is progressively emerging as a notable export commodity. Notably, the export of organic food products surged by 51 per cent, reaching US$ 1040 million in 2020-21, surpassing the preceding year's figure of US$ 689 million, despite challenges posed by disruptions in the supply chain induced by the COVID-19 pandemic. Acknowledging India's reliance on rain-fed agriculture, which holds promise for organic methodologies, the GOI is directing its focus towards the promotion of organic agriculture by allocating funds through various development initiatives. Furthermore, states like Uttarakhand, Mizoram and Sikkim have proclaimed themselves as organic states.

In alignment with these efforts, the National Programme for Organic Production (NPOP) was inaugurated in May 2000 with the overarching aim of fostering organic farming practices across India (Jaganathan, et. al. 2010). Farmer's apprehension towards in India is rooted in non-availability of sufficient organic supplements, bio fertilizers and local market for organic produce and poor access to guidelines, certification and input costs (Baraiya, et. al. 2022). There is need to modify agricultural practices by integrated approach of crop management 'towards organic' which would also be appropriate in the states contributing major share to the national food basket (Alaukh, Ravishankar, 2017). This study was aimed to seek the relation between independent and dependent variables of the farmers practicing organic and non-organic agriculture ultimately bringing out the factors responsible for adoption of organic farming practices which needs to be encouraged by the policy makers for its further promotion. Therefore, the objectives under study were-

OBJECTIVE

To explore factors affecting knowledge of farmers regarding organic farming practices among farmers practicing organic and non-organic farming.

METHODOLOGY

The study was conducted in 2021-22 in Jabalpur district. Five operational clusters of farmers engaged in organic farming under the Paramparagat Krishi Vikas Yojana were found in four blocks of the Jabalpur district, viz. Sihora, Jabalpur, Patan and Majholi. Out of 250 farmers of the clusters practicing organic farming from these blocks, 120 farmers were selected purposively to form the population under study. Same number of farmers i.e. 120 practicing conventional or non-organic farming practices were selected for comparative study. The relationship between the twenty-six independent variables for farmers practicing organic agriculture and eighteen independent variables for farmers practicing non-organic agriculture with their knowledge levels regarding organic practices in agriculture was analyzed using Pearson's correlation coefficient. The significance of the correlation was tested using Student's t-test with n-2 degree of freedom.

RESULTS AND DISCUSSION

Table 1.Clearly describes that knowledge of farmers practicing organic farming (Y_1) has positive and significant relationship with area under organic farming (r=0.366), risk orientation (r=0.243), innovativeness (r=0.238), trainings received on organic farming (r=0.244), experience in organic farming (r=0.245), environment orientation (r=0.254), attitude towards organic farming practices (r=0.244), relative advantage of organic farming practices (r=0.239), compatibility of organic farming practices (r=0.235), trialability of organic farming practices (r=0.238) and observability of organic farming practices (r=0.284) at 1 per cent level of probability. Whereas farm size (r=0.185), social participation (r=0.212), livestock possession (r=0.194), mass media exposure (r=0.187), information sources (r=0.197), market perception (r=0.218) and decision making (r=0.209) were positive and significant at 5 per cent level of probability with knowledge.

However, positive and significant relationship found at 1 per cent level of probability between knowledge and mass media exposure (r=0.240), information sources (r=0.235), scientific orientation (r=0.247), risk orientation (r=0.256) and attitude towards organic farming (r=0.223) among farmers who were not engaged in organic farming. At the 5 per cent probability level, market perception (r=0.186), innovativeness (r=0.187), trainings received on organic farming (r=0.180) and environment orientation (r=0.193) had positive and significant relationship with knowledge.

Table 1: Relationship of attributes of farmers with their knowledge level (n=240)

Variable No.	Independent variable	Farmers practicing organic farming (n1=120)		Farmers practicing non-organic farming (n2=120)	
		Correlation coefficient 'r' values	t-values	Correlation coefficient 'r' values	t-values
A	**Socio-Personal Variables**				
X_1	Age	0.063^{NS}	0.694	0.012^{NS}	1.300
X_2	Education	0.115^{NS}	1.258	0.093^{NS}	1.026
X_3	Farm size	0.185*	2.044	0.102^{NS}	1.113
X_4	Area under organic farming	0.366**	4.56	-	-
X_5	Area under non-organic farming	0.151^{NS}	1.66	-	-

Variable No.	Independent variable	Farmers practicing organic farming (n1=120)		Farmers practicing non-organic farming (n2=120)	
		Correlation coefficient 'r' values	t-values	Correlation coefficient 'r' values	t-values
X_6	Social participation	0.212*	2.357	0.082 NS	0.894
B	**Economic Variables**				
X_7	Occupation	0.013 NS	0.155	0.051 NS	0.554
X_8	Annual family Income	0.143 NS	1.569	0.130 NS	1.425
X_9	Livestock possession	0.194*	2.159	0.033 NS	0.358
C	**Communicational Variables**				
X_{10}	Mass Media exposure	0.187*	2.068	0.240**	2.685
X_{11}	Information sources	0.197*	2.184	0.235**	2.626
D	**Psychological Variables**				
X_{12}	Scientific orientation	0.103 NS	1.125	0.247**	2.769
X_{13}	Risk orientation	0.243**	2.722	0.256**	2.890
X_{14}	Market perception	0.218*	2.426	0.186*	2.057
X_{15}	Decision making	0.209*	2.332	0.178 NS	1.965
X_{16}	Innovativeness	0.238**	2.662	0.187*	2.068
X_{17}	Trainings received on organic farming	0.244**	2.732	0.180*	1.987
X_{18}	Farming experience	0.003 NS	0.032	0.009 NS	0.980
X_{19}	Experience in organic farming	0.245**	2.746	-	-
X_{20}	Environment orientation	0.254**	2.853	0.193*	2.136
X_{21}	Attitude towards organic farming practices	0.244**	2.732	0.223**	2.617
E	**Other Variables**				
X_{22}	Relative advantage of organic farming practices	0.239**	2.673	-	-
X_{23}	Compatibility of organic farming practices	0.235**	2.626	-	-
X_{24}	Complexity of organic farming practices	0.059 NS	0.642	-	-
X_{25}	Trialability of organic farming practices	0.238**	2.662	-	-
X_{26}	Observability of organic farming practices	0.284**	3.217	-	-

*Significant at 0.05 level of probability ** Significant at 0.01 level of probability NS-Non-Significant

Correlation coefficient was worked out and tested significant for twenty-six variables categorized into different groups for different categories of farmers under study through comparing table values to find the relationship between independent variables and knowledge. The study revealed following rationality behind such findings.

Socio-Personal Variables and Knowledge

The socio-personal variables under study included age, education, farm size, area under organic farming, area under non-organic farming and social participation which are clearly depicted in Table 1.

The absence of a significant correlation between age and knowledge levels among farmers engaged in organic and non-organic farming practices suggests that factors such as experience in organic farming, innovativeness and attitude exert a more pronounced influence on knowledge acquisition than chronological age.

The educational attainment of farmers was not found to significantly correlate with their knowledge levels. This observation can be attributed to the finding that even farmers with limited or primary education exhibited a moderate level of knowledge.

The relationship between farm size and knowledge among organic farmers was deemed significant, whereas among non-organic farmers, it was deemed non-significant. As farm size increases, farmers are incentivized to transition

towards organic farming practices, potentially allocating portions of their land for organic cultivation. This shift fosters greater engagement in organic practices and subsequently enhances their knowledge base (Jadeja and Deshmukh, 2014).

The variable representing the area dedicated to organic farming was exclusively analyzed among farmers engaged in organic agricultural practices, yielding a significant outcome. This finding suggests that an increase in the area devoted to organic farming correlates positively with the adoption of organic practices by farmers, thereby enhancing their knowledge in this domain.

The variable representing the area dedicated to non-organic farming was similarly assessed exclusively among farmers engaged in organic agricultural practices, yielding a non-significant correlation with knowledge levels. This outcome suggests that as farmers did not employ organic practices on the land designated for non-organic farming, their knowledge in organic farming remained constrained.

The correlation coefficient pertaining to social participation was deemed significant among farmers engaged in organic farming, whereas it was non-significant among those practicing non-organic farming. Increased engagement in social interactions, including discussions, networking and participation in meetings, facilitates greater exposure to diverse subjects thereby enhancing farmers' knowledge levels, both in agricultural and non-agricultural domains (Pyasi et. al*.,* 2012).

Economic Variables and Knowledge

Economic variables under research comprises of three variables viz. occupation, family income and livestock possession, clearly depicted in Table 1.

The occupation variable exhibited no discernible correlation with farmers' knowledge levels.

The correlation coefficient between annual family income and knowledge was determined to be non-significant. This finding can be attributed to the absence of significant differences in family income between both categories of farmers, stemming from factors such as the lack of certification and a decline in market prices for organic produce. Consequently, annual family income did not exert an influence on farmers' knowledge levels (Jadeja and Deshmukh, 2014).

The possession of livestock exhibited a significant correlation with the knowledge levels of farmers engaged in organic farming, whereas it showed a non-significant relationship among those practicing non-organic farming. Farmers may opt for organic farming practices due to the availability of organic manure from their livestock or due to possessing a larger livestock inventory, which mitigates the shortage of manure. A robust livestock possession not only serves as a motivation for farmers to adopt organic methods but also contributes to the enhancement of their knowledge in this domain (Jaganathan et. al*.,* 2012, Jadeja and Deshmukh, 2014).

Communicational Variables and Knowledge

Communicational variables included mass media exposure and information sources utilized to find communicational pattern among the farmers shown in Table 1.

The correlation coefficient pertaining to mass media exposure demonstrated significance in relation to knowledge levels for both the categories of farmers. Mass medium platforms such as social media, mobile devices, television and radio instill curiosity among farmers regarding organic farming practices. Consequently, increased exposure to mass media channels is likely to contribute to he accumulation of knowledge among farmers (Kumar et. al*.,* 2021, Naik et. al*.,* 2009).

The variable information sources exhibited a significant relationship with the knowledge levels of both categories of farmers. Increased exposure to diverse information mediums fosters the acquisition of knowledge and expertise across various domains. Thus, farmers who utilize a wider range of information sources are more likely to enhance their understanding of organic farming practices, consequently augmenting their overall knowledge base (Oyesola et. al*.,* 2011).

Psychological Variables and Knowledge

Psychological variables covers a vast range of variables from scientific orientation, risk orientation, market perception, decision making, innovativeness, trainings received on organic farming, farming experience, experience in organic farming, environment orientation to attitude towards organic farming practices of the farmers depicted clearly in Table 1.

The scientific orientation of farmers engaged in organic farming showed a non-significant relation with knowledge levels, whereas it was significant among farmers practicing non-organic farming. This discrepancy may be attributed to the fact that farmers involved in non-organic farming tend to adopt more scientifically advanced and modern cultivation practices. As these farmers employ

scientific methodologies to optimize cultivation costs and maximize profits, their approach influences the depth of their agricultural knowledge(Kumar et. al*.,* 2021).

The risk orientation of farmers exhibited a significant correlation with their knowledge levels. Farmers who embrace a greater risk-taking behaviour often stand to achieve higher profits, as they navigate complex agricultural scenarios and adapt their strategies accordingly. Organic farmers, in particular, not only adhere to recommended practices but also rely on their individual approaches, patiently awaiting outcomes while embracing risk. Effectively addressing such challenges notably enhances their agricultural knowledge (Jaganathan et. al*.,* 2012).

The market serves as the primary platform for farmers where they ultimately dispose off their produce to gain profits. Additionally, it functions as a venue where farmers explore opportunities to enhance profitability through alternative methods, such as reducing cultivation costs. This pursuit of alternatives contributes to the enrichment of their knowledge base.

The significance of decision-making was observed in its correlation with the knowledge levels of farmers engaged in organic farming, whereas it proved non-significant among those practicing non-organic farming. Effective decision making at opportune moments cultivates farmers' abilities as decision-makers, thereby impacting their knowledge acquisition. Collaborative decision-making, which incorporates diverse perspectives and opinions, fosters the generation of multiple alternatives and choices, consequently influencing knowledge enrichment (Jaganathan et. al., 2012).

The innovativeness of the farmers demonstrated a significant relation with their knowledge levels. Farmers exhibit a propensity to engage with novel practices and actively seek out new information, thus contributing to the continuous evolution and enhancement of their knowledge. Innovatively inclined farmers readily embrace changes in farming methodologies, facilitating ongoing cognitive updating. Organic farming, inherently innovative in nature, serves as a catalyst for transforming farmers into agents of innovation (Naik et.al*.,* 2009).

In case of trainings received on organic farming, correlation coefficient was significant with the knowledge levels. Training sessions serve as a means to refine the skills and cognitive abilities of individuals. Increased participation in trainings related to organic farming correlates positively with the development of expertise and knowledge among farmers in this domain.

Farming experience was determined to be non-significant in relation to knowledge levels concerning organic farming practices. The duration of farming experience appears to have no bearing on organic farming knowledge acquisition unless individuals actively engage in adopting organic farming methods.

The variable experience in organic farming was exclusively examined among farmers engaged in organic agricultural practices. With each additional year dedicated to organic farming, farmers accumulate knowledge through the implementation of various practices and the observation of anticipated outcomes. This iterative process of practice contributes significantly to the enhancement of their expertise (Hameed and Sawicka, 2016; Rohan and Vinaya, 2022).

The environmental orientation of farmers in both the categories was found to have a significant correlation with their knowledge levels. Conscious efforts to produce eco-friendly and less polluted crops, which typically fetch higher prices compared to non-organic produce, have contributed to the knowledge acquisition of farmers. Given the paramount importance of health, the strong desire to be recognized as socially responsible farmers, both in terms of reputation and financial gain, likely prompted their shift towards organic farming, thereby fostering the advancement of their expertise.

The correlation between attitude towards organic farming practices and knowledge levels was found to be significant. A positive attitude towards organic farming motivates farmers to engage in continuous learning within this domain. Their receptiveness to new information and practices is enhanced by their favourable disposition towards organic farming, ultimately shaping their knowledge base in this field.

Other Variables and Knowledge

Among the category of other variables; relative advantage of organic farming practices, compatibility of organic farming practices, complexity of organic farming practices, trialability of organic farming practices and observability of organic farming practices were studies only for the farmers practicing organic farming on their farms shown in Table 1.

Relative advantage of organic farming practices revealed a significant correlation with knowledge levels. Practices that offer greater relative advantages tend to garner heightened attention and interest from individual farmers.

Compatibility of organic farming practices yielded a significant correlation with knowledge levels. The adoption of new or existing agricultural practices should align with the

situational and cultural contexts of society and individuals to establish a solid foundation for implementation.

Upon correlating complexity variable with the knowledge of farmers practicing organic farming, it was found non-significant. The intricate nature of certain farming practices detracts from their popularity and adoption among farmers. Many farmers perceive organic farming practices to be more complex compared to non-organic practices.

The variable trialability of organic farming practices had significant correlation with knowledge levels. The ability to trial organic farming practices on small land areas with limited resources influences knowledge acquisition in this domain.

The last variable of the study observability of organic farming practices depicted a significant correlation with the knowledge levels. More the outcomes of an innovation are observable to the audience, more is its adoption.

CONCLUSION

In response to environmental degradation, particularly concerning soil health, crop vitality and human well-being, there has been a notable paradigm shift towards prioritizing sustainable agricultural practices, notably organic farming, while diminishing reliance on chemical inputs. This research underscores pivotal variables necessitating incorporation into forthcoming policies and initiatives to incentivize farmers towards organic agricultural methodologies. Variables including training in organic farming, acreage dedicated to organic practices, experiential proficiency, innovation capacity, risk propensity and environmental consciousness have exhibited positive influence on farmers. Attitude towards organic farming, perceived relative advantages, compatibility, trialability and observability of organic practices, alongside mass media exposure and information sourcing, emerge as pivotal determinants in fostering farmer receptivity. It is imperative for governmental, private and non-governmental entities to integrate these factors into policy frameworks to bolster agricultural communities' morale and facilitate widespread adoption of organic farming practices, thereby steering agricultural production towards enduring sustainability.

RECOMMENDATION

- Regular training programmes, workshops, seminars etc. on organic farming techniques should be organized.
- Awareness campaigns focusing on long term benefits of organic farming on ecosystem and its components should be organized frequently at regional and national levels.
- Introduction of financial incentives like subsidies, low-interest loans etc. and rewards for farmers demonstrating consistent adoption of organic farming encourages farmers.
- Establishment of dedicated organic produce markets, certification assistance and ensuring premium prices for organic produce facilitates adoption of organic farming among farmers.
- Strengthening information channels, increasing social participation of farmers, supporting farmers for innovation and trialability along with policies formed for farm size and livestock management may result in increased adoption of organic & sustainable framing practices.

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CONFLICT OF INTEREST

'No Conflict of Interest' is stated among all the authors.

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