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RESEARCH ARTICLE

Adoption Level Association of Farmers regarding Recommended Tomato Production Practices in Haryana

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ABSTRACT

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The vegetable sector plays a vital role in farm income enhancement and alleviation of poverty in many developing countries, whereas tomato is one of the vegetable crops that has a high demand throughout the world. The annual production of fresh tomatoes accounts to approximately 180 million tonnes. Thus, the present study was carried out in four districts viz., Nuh Sonipat, Gururgram and Palwal of Haryana state, so as to know the adoption level of farmers. Primary data on tomato growers was collected by applying purposive and systematic random sampling procedures for the selection of districts and respondents. The investigation was focused on the adoption level of the farmers regarding improved production practices of tomato. Results from the present study reveals that majority (55.63%) of the respondents were having medium level of economic motivation followed by high economic motivation. Results also revealed that out of 13 variables selected to study the relationship, six variables, viz., education, mass media exposure, economic motivation, innovativeness and experience showed positive and age showed negative correlation at 5 per cent level of probability. Whereas, multiple regression analysis between selected independent variables and adoption level of the respondents inferred that, all the eleven variables together contributed 51.20 per cent variation in the adoption level of the farmers about production technology/practices of tomato cultivation.

Key words : Tomato production; Economic motivation.

Tomato is one of the vegetable crops that has a high demand throughout the world. The annual production of fresh tomatoes accounts to approximately 180 million tonnes (FAO, 2019). Among vegetables, tomato is one of the important crops and it occupies a significant position in the vegetable production in the country. In India the total production of tomato is 20.70 million tonnes from 796.87 thousand hectares area (FAOSTAT 2019-20), which is 08.00 per cent higher than the normal production. Whereas, the total annual export of tomato from India was 47.45 thousand million tonnes in 2017-18. The major three tomato producing states in the country are Madhya Pradesh, Andhra Pradesh and Karnataka. Haryana ranked at 11th position in vegetable and 13th in tomato production in the country with a total production of 61.57 lakh MT from an area

of 410.74 thousand hectare. The tomato is produced throughout the year in the state. Major tomato growing districts in Haryana are Mewat (area 5.34 thousand ha and production 150.31 thousand MT), followed by Yamunanagar, Sonipat, Karnal, Jind, Rohtak and Panipat. Tomato is a major commercial crop in the state and accounts for 494.53 thousand tones with a 2.40 per cent share in the countries production in 2019-20 (Horticultural Statistics, 2018).

Tomato is an important vegetable in Haryana. It is widely consumed due to its high nutritive value. Tomato production in Haryana is dominated by poorly resourced smallholder farmers and relatively advanced semi-commercial farmers who practice protected cultivation using greenhouses. Although cost of production in the crop cultivation under polyhouse/greenhouse conditions was higher than

open field conditions, however at the same time the gross returns as well as net returns were significantly better under polyhouse cultivation (*Rani, et. al., 2022*). The major issues in existing marketing supply chain of fresh vegetables in India are high marketing cost, high marketing loss, low marketing efficiency and producer’s share in consumer’s price as well as high consumer price (*Goyal, 2022*). Further, the extension gaps as well as technological gaps emphasizes that there was need for capacity building of farmers through various extension programmes for adoption of improved agricultural technologies to enhance further yield and profit.

METHODOLOGY

The present investigation was purposively conducted in four districts namely; Gurugram, Nuh, Palwal and Sonipat of Haryana state, as these districts are contributing highest production of tomato in the state. Further, two blocks from each of four districts and two villages from each block were chosen, randomly. Finally, ten farmers from each village were selected randomly, thus making a total sample of 160 tomato growers. The data was collected with the help of a well-structured and pretested interview schedule comprising the items for assessment of economic motivation of the farmers and association of farmer’s adoption level regarding production technology of tomato. The economic motivation and adoption level

were computed with the statistical measures like frequency, percentages, weighted mean score, rank order, correlation and multiple regression used to analyze the data to draw the tangible and meaningful inferences from the study.

RESULTS AND DISCUSSION

Distribution of tomato growers according to their economic motivation : Data presented in Table 1 revealed that majority of the respondents perceived that “a farmer should work hard towards larger yield of economic profits” and were highly motivated indicated with weighted mean score 4.23 ranked first followed by “a farmer should try any new farming which may earn more money” ranked second with weighted mean score 3.82, “it is difficult for the farmers to make good start unless being provided the economic assistance” ranked third with weighted mean score 3.93. Whereas, “the most successful farmer is the one who makes more profits” ranked fourth with weighted mean score 3.71, followed by “A farmer must earn his living, but the most important thing is that the life cannot be defined in economic terms” ranked fifth with weighted mean score 3.64 and “a farmer should grow cash crops to increase profit in comparison to growing of food crops for home consumption” ranked sixth with weighted mean score 2.85. The findings are on similar trend with the findings of *Mane (2012)*.

Table 1. Distribution of respondents according to their economic motivation

Statements	SA (5)	A (4)	UD (3)	DA (2)	SDA (1)	Total Score	WMS	Rank
A farmer should work hard towards larger yield of economic profits.	74 (46.30)	68 (42.50)	00 (00.00)	18 (11.30)	00 (00.00)	678	4.23	I
The most successful farmer is the one who makes more profits	58 (36.30)	44 (27.50)	12 (07.50)	46 (28.80)	00 (00.00)	594	3.71	IV
A farmer should try any new farming which may earn more money	34 (21.30)	85 (53.10)	20 (12.50)	21 (13.10)	00 (00.00)	612	3.82	II
A farmer should grow cash crops to increase profit in comparison to growing of food crops for home consumption	08 (05.00)	43 (26.90)	35 (21.90)	65 (40.60)	09 (05.60)	456	2.85	VI
It is difficult for the farmers to make good start unless being provided the economic assistance.	20 (12.50)	69 (43.10)	39 (24.40)	18 (11.30)	14 (08.70)	543	3.93	III
A farmer must earn his living, but the most important thing is that the life cannot be defined in economic terms	21 (13.10)	88 (55.00)	29 (18.10)	17 (10.60)	05 (03.10)	583	3.64	V

*SA=Strongly agree, A=Agree, UD=Undecided, DA=Disagree, SDA=Strongly disagree,

Table 2. Overall distribution of economic motivation pattern of farmers

Categories	No.	%
Low (Less than 20)	32	20.00
Medium (20-24)	89	55.63
High (more than 24)	39	24.37

Distribution of tomato growers according to their economic motivation : Data presented in Table 2 shows that 55.63 per cent of the respondents were having medium level of economic motivation followed by, 24.37 per cent having high and 20.00 per cent having low level of economic motivation. It might be due to the reason that, majority of the farmers had medium annual income and therefore, they had medium economic motivation level. The findings of the study are in agreement with the results obtained by *Mane (2012)* and *Ramrao (2018)* revealed that majority of the farmers (60.32%) were having medium economic motivation level followed by low and high economic motivation.

Relationship between selected independent variables and adoption level : The data presented in Table 3 reveals that, out of 13 variables selected to study the relationship, six variables, viz., education, mass media exposure, economic motivation, innovativeness and experience showed positive and age showed negative significant relationship at 5 per cent level of probability. Whereas, extension contact and extension participation showed positive and highly significant at 1 per cent level of probability. Other variables namely, landholding, annual income, decision making pattern, scientific orientation and cosmopolitaness were found non-significant with the adoption level of the tomato growers towards production technology of tomato.

Data presented in Table 3 shows that there is negative and significant relationship between the age and adoption level of the tomato growers at 5 per cent level of probability. This might be due to the reason that middle and young age farmers are more active and had higher retaining capacity as compared to old age group people as with the increase in age our thinking and reasoning capacity somehow diminished. Further, education and adoption level of farmers was positively correlated at 5 per cent level of significance. As education is the production of desirable changes in human behavior, therefore it will help the individuals to make progress in right direction and it develops awareness about new technology among the farmers.

Table 3. Relationship between selected independent variables and post-harvest adoption level of the tomato growers

Independent variables	(r)
Age	-0.185*
Education	0.175*
Land holding	0.056 ^{NS}
Annual income	0.060 ^{NS}
Mass media exposure	0.193*
Extension contact	0.220**
Extension participation	0.286**
Economic motivation	0.169*
Innovativeness	0.168*
Decision making pattern	0.062 ^{NS}
Scientific orientation	0.036 ^{NS}
Experience	0.160*
Cosmopolitaness	0.147 ^{NS}

** Significant at 1%, * Significant at 5% and NS= non-Significant

The present findings are supported by the findings of *Lokhande (2010)* revealed positive and significant relationship among education and adoption level of farmers at five per cent level of probability.

Data presented in Table 3 reveals that mass media exposure and adoption level of farmers was positively correlated at 5 per cent level of significance. The higher degree of exposure to mass media will facilitate the farmers to develop habit of gathering more information and innovations through television, radio, mobile phones and other ICT devices. The mass media exposure modernizes the farmers, make them more efficient in acquiring, retaining and evaluating the effective factors of adoption. Followed by, extension contact and adoption level of tomato growers was found positive and highly significant at 1 per cent level of probability. This might be due to the fact that farmers with more extension contact are in regular touch with the extension functionaries, acquire more knowledge about advanced technologies and practices related to production of tomato which result in the adoption of these production practices by the farmers in their own farming situations. Whereas, farming experience and adoption level had positive and significant relationship at 5 per cent level of probability. The tomato growers were always would like to take advantage of knowing the tomato production practices through farming

experience. There is an active involvement of farmers in farming activities, is the main thing which helps to gain knowledge and adopt tomato production practices. The findings are in conformity with the study of *Ambedkar (2010)* and *Rashmi (2018)* that there is significant relationship between mass media exposure, extension contact, farming experience and adoption level of the farmers at five per cent level of significant.

Perusal of Table 3 reveals that there was positive and highly significant relationship between extension participation and adoption level of farmers at 1 per cent level of probability. The participation in extension activities provide the opportunities for contrived experiences and serves as medium and channel for gaining knowledge about agricultural innovations and advanced technologies, which leads to quick decision of farmers regarding their adoption. The results cited above are in conformity with the findings of *Rathod (2005)* and *Kanavi (2000)* reported that farmers had positive and significant relationship between extension participation and adoption level. Further, Data presented in Table 3 reveals that economic motivation and adoption level was positively correlated at five per cent level of significance. As when farmers develop higher levels of economic motivation and wants to achieve it, he would strive hard and get internalize himself about different aspects of tomato production besides aiming at profit maximization. The present study is in conformity with the findings reported by *Raghavendra, (2005)* and *Ambedkar (2010)* that economic motivation and adoption level had positive and significant relationship at five per cent level of probability.

Table 3 shows that innovativeness and adoption level was positively correlated at 5 per cent level of significance. This might be due to the fact that farmers with high degree of innovativeness will naturally adopt the new technologies. The excellence or perfection in what one does is determining the innovativeness and to achieve destination one need to take adequate and meticulously care with their innovative ideas to achieve success maximizing and sustaining yield and income. The results are in conformity with the findings of *Shashidhara (2006)* and *Ravi kumar (2010)* revealed that innovativeness and adoption level had positive and significant relationship at five per cent level of probability.

Table 4. Multiple regression between selected independent variable and adoption level of the tomato growers

Independent variables	' β ' value	't' value	ρ value
Age	- 0.250	-0.278	0.782 ^{NS}
Education	0.174	0.324	0.740 ^{NS}
Land holding	0.546	0.835	0.405 ^{NS}
Annual income	0.960	0.949	0.344 ^{NS}
Mass media exposure	0.943	3.104	0.002**
Extension contact	0.305	1.459	0.147 ^{NS}
Extension participation	0.716	3.455	0.001**
Economic motivation	0.418	2.140	0.034*
Innovativeness	0.523	2.553	0.012*
Decision making pattern	0.381	1.632	0.105 ^{NS}
Scientific orientation	0.518	2.060	0.041*
R square value		0.512	
Constant		49.430	

** Significant at 1%, * Significant at 5% and NS= non-Significant

Multiple regression between selected independent variable and adoption level of the tomato growers about production technology/practices of tomato cultivation : The results presented in Table 4 clearly shows that multiple regression analysis between selected independent variables and adoption level of the respondents about production technology of tomato cultivation was inferred that, all the eleven variables together contributed 51.20 per cent variation in the adoption level of the farmers about production technology/practices of tomato cultivation. The regression coefficient of economic motivation, innovativeness and scientific orientation were significant at 5 per cent level of probability. While, mass media exposure and extension participation were significant at 1 per cent level of probability. Therefore, it can be predicted that, one unit change in the independent variables leads to corresponding change in adoption level of the farmers.

CONCLUSION

The study was mandated the adoption behavior of tomato growers for advanced production practices. In our country, the cultivation of tomato is carried out mostly on small farms without any organized backup for packaging, storage, transport and marketing. However, the farmers be set with the problems of low productivity, inadequate availability of good quality

seeds, inadequate extension services, unorganized marketing, poor post-harvest facilities, inadequate infrastructure and lack of high-quality equipment's and inputs. Thus, the present investigation was an attempt to highlight the extent of adoption of improved practices by the farmers. The results of research from the present study would serve as the guidelines for planners, trainers and extension scientists, etc. in order to reduce the impact of losses of tomato and hence, more availability of quality and nutritive production. Therefore, they should focus and pay attention towards this problem and develop better production technologies, marketing facilities and post-harvest technologies for the growers.

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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