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Farmer's Knowledge Level towards Improved Tomato Cultivation Practices in Mokokchung District of Nagaland, India

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Tomato is one of the nutritious and commercially important vegetable that can be cultivated in indoor and outdoor during all seasons. But lack of technical knowledge and awareness towards improved tomato cultivation practices lead to reduced yield and productivity. Hence, to increase the productivity of the tomato, improved tomato cultivation practices should be adopted. To serve this purpose, this study was attempted to understand the knowledge level of the tomato growers towards improved tomato cultivation practices and the factors influencing it. Twenty tomato growers from each villages of Longkhum, Ungma, Mangmetong, Aliba, Chungtia and Khensa in Ongpangkong block of Mokokchung district, Nagaland was selected as primary respondents of the study. The data gathered from the tomato growers were analyzed with suitable statistical tools. From the study, it could be observed that nearly half of the tomato growers had medium level of knowledge and educational status, size of land holding under tomato cultivation, annual income and mass media exposure had significant relationship with the knowledge level of the tomato growers towards improved tomato cultivation practices.

Keywords: Knowledge level; improved tomato cultivation practices; Mokokchung district; tomato growers; factors influencing; socio-economic profile.

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1. INTRODUCTION

High nutritional value of vegetables holds an important place in human diet and makes vegetable cultivation as an important commercial enterprise at National and International level. Though India is a leading producer of vegetables and supplies more than 100 types of vegetables, it doesn't meet the nutritional requirement of Indian population. According to FAO, 400g of vegetables were required for each individual, but only 86g was available. Among the various widely grown solanaceous vegetables, tomato (*Lycopersicon esculentum*) is one of the short duration crop that can be grown in indoor and outdoor conditions. Tomato can be grown under different cropping system and produces more yield which is higher economic value. Tomato is regarded as the "King of Vegetables" and "Poor man's Orange" because of the high level of nutrient contents.

According to 2014-15 statistical data, 170.8 million tonnes of tomato was produced in the world. China is the leading producer of tomato (52.7 million tonnes), followed by India (18.39 million). In India, tomato was cultivated in 808.54 hectares which gives an yield of 19696.92 MT; indicating a productivity of 24.36 MT per hectare which accounts for 7.9 per cent of the total vegetable production (2016-17). In Nagaland, tomatoes were locally known as 'Sei bangenuo' which means 'tree tomato' or 'tamarillo'. Naga tree tomatoes had GI tag. Apart from consumption of vegetable, tomato plays a significant role in various commercial enterprises like ketchup, soup, chutney, puree preparation, etc.

Similar study by Singh et al. [1] reported that one-third of the farmers (33.30%) had high level of knowledge towards improved tomato cultivation technology, followed by 41.70 per cent and 25 per cent of the farmers had medium and low level of knowledge towards improved tomato cultivation technology. Sangavi et al. [2] indicated that tomato growers in Madurai district were middle aged (40%), had primary school education (35.56%), medium farm size under tomato cultivation (47.77%), above 20 years of farming experience (65.56%), earns an annual income of below Rs.50,000 (65.56%), had attended one-training (43.33%) with medium level of information source utilization (45.56%), economic motivation (58.89%), scientific orientation (55.56%) and innovativeness (55.56%).

While, Eviness et al. [3] revealed that tomato growers in Malawi were mostly male under the age of 31-41 years, married with primary level of education. Most of the farmers had agriculture related occupation with had 6-10 years of farming experience and earns an annual income of 100,000-500,000 MK. Madhuri et al. [4] examined the factors influencing the knowledge level of tomato growers in Chitoor district and identified that characteristics such as education, annual income, farm size, mass media exposure, extension contact, risk orientation, scientific orientation, innovativeness, management orientation and achievement motivation had positive and significant relationship with their knowledge level. Whereas, age and farming had negative and significant relationship; marketing facilities and credit orientation had negative and non-significant relationship with their knowledge level.

1.1 Statement of the Problem

To serve the nutritional requirement for growing Indian population and to minimize the post harvest losses, improved vegetable cultivation practices should be adopted by the farmers. The climate in Ongpankong block of Mokokchung district is very much suitable for tomato cultivation. But, farmer's lack technical knowledge and awareness on improved tomato cultivation practices lead to reduced yield and productivity. Hence, in order to increase the farmer's technical knowledge and awareness, their knowledge and adoption level towards improved tomato cultivation practices should be studied. This study was proposed to serve this purpose with the following objectives:

1. To ascertain the socio-economic profile of the farmers.
2. To determine the knowledge level of farmers towards improved tomato cultivation practices.
3. To analyse the extent of association between socio-economic profile with the knowledge level of the farmers.

2. METHODOLOGY

The proposed study was carried out in Ongpangkong block of Mokokchung district, Nagaland, India. Descriptive research design was adopted, since the phenomenon under research was already occurred. Mokokchung district of Nagaland was studied, as it possess more area under tomato cultivation. Among 9

blocks in Mokokchung district, Ongpangkong block was selected as more number of tomato growers were residing there. Among the various tomato growing villages, six villages namely Longkhum, Ungma, Mangmetong, Aloba, Chungtia and Khensa were selected randomly. From each village, 20 tomato growers were selected, thus constitutes 120 tomato growers as primary respondents for the study. The data were collected from the tomato growers with the help of interview schedule through personal interview. The gathered data were tabulated, analysed and presented as follows.

3. RESULTS AND DISCUSSION

The socio-economic profile of the tomato growers in Mokokchung district was studied under various characteristics such as age, educational status, occupational status, marital status, size of land holding, family size, annual income, social participation, training exposure, scientific orientation, mass media exposure, extension agent contact and presented in Table 1.

From Table 1, it was evident that half of the tomato growers were middle aged (50%), followed by young aged (30%) and old aged (20%) farmers. While, more than one-fifth of the tomato growers had high school level of education (21.66%), followed by middle school education (16.66%), higher secondary education (15%), collegiate education (15%), primary school education (14.16%), functionally literate (10.86%) and only 6.66 per cent of them were illiterate. Half of the tomato growers had agriculture alone (50%) as their occupation, followed by agriculture + labour (25%), agriculture + business (15%) and agriculture + government or private services (10%) as their occupation. Above majority (92.50%) of the tomato growers were married and remaining 7.50 percent of them were unmarried or divorced or separated.

Table 1. Socio-economic profile of the tomato growers in Mokokchung district

(n=120)

S. No.	Socio-Economic profile characters	Number	Per cent
1.	**Age**		
	Young	36	30.00
	Middle	60	50.00
	Old	24	20.00
2.	**Educational status**		
	Illiterate	08	06.66
	Functionally literate	13	10.86
	Primary school education	17	14.16
	Middle school education	20	16.66
	High school education	26	21.66
	Higher secondary education	18	15.00
	Collegiate education	18	15.00
3.	**Occupational status**		
	Agriculture alone	60	50.00
	Agriculture + Business	18	15.00
	Agriculture + Labour	30	25.00
	Agriculture+ Government / Private services	12	10.00
4.	**Marital Status**		
	Married	111	92.50
	Unmarried/Divorced/Separated	9	7.50
5.	**Size of land holding**		
	Up to 2.5 acres	63	52.50
	2.5 acres to 5 acres	41	34.17
	More than 5 acres	16	13.33
6.	**Family size**		
	Small	66	55.00
	Medium	42	35.00
	Big	12	10.00

S. No.	Socio-Economic profile characters	Number	Per cent
7.	**Annual Income**		
	Very low income (Upto 1 Lakh)	08	06.67
	Low income (1 to 2 lakhs)	34	28.33
	Medium income (2 to 3 lakhs)	36	30.00
	High income (Above 3 lakhs)	42	35.00
8.	**Extension agent contact**		
	Low	36	30.00
	Medium	57	47.50
	High	27	22.50
9.	**Social participation**		
	Low	59	49.17
	Medium	40	33.33
	High	21	17.50
10.	**Training exposure**		
	Low	100	83.40
	Medium	19	15.80
	High	1	0.80
11.	**Scientific orientation**		
	Low	32	26.67
	Medium	77	64.17
	High	11	09.16
12.	**Mass Media Exposure**		
	Low	32	26.67
	Medium	37	30.83
	High	51	42.50

More than half of the tomato growers (52.50%) had land holding up to 2.5 acres, followed by 34.17 per cent and 13.33 per cent of them had 2.5 – 5 acres and more than 5 acres of land holding respectively. 55 per cent, 35 per cent and 10 per cent of the farmers had small, medium and big size of family respectively. Higher proportion of the tomato growers earns high level of annual income (35%), followed by medium (30%), low (28.33%) and very low (6.67%) level of annual income. Less than half of the tomato growers had medium level of extension agency contact (47.50%), followed by low (30%) and high (22.50%) level of extension agent contact. Nearly half of the farmers had low level of social participation (49.17%), followed by medium (33.33%) and high (17.50%) level of social participation.

More than three-fourth of the tomato growers had low level of training exposure (83.40%), followed by medium (15.80%) and high (0.80%) level of training exposure. Less than two-third of the tomato growers had medium level of scientific orientation (64.17%), followed by low (26.67%) and high (9.16%) level of scientific orientation. Eventually, more than one-third of the tomato growers had high level of mass media exposure (42.50%), followed by medium (30.83%) and low (26.67%) level of mass media exposure. Similar studies were reported by Sangavi et al. [2] and Eviness et al. [3].

The knowledge level of the tomato growers towards various recommended tomato cultivation practices was studied on a two-point continuum as fully known and not known and presented in Table 2.

From Table 2, it could be observed that higher percentage of the tomato growers had knowledge on disease identification (93.33%), harvesting (84.17%), yield (79.17%), seed treatment (75%), disease control (74.17%), pest control (71.67%), sowing time (65.83%), seed rate (64.17%), method of sowing (62.50%), field preparation (61.67%) and methods of irrigation (57.50%). Whereas less than half of the farmers had lack of knowledge towards spacing (49.17%), weed management (45.83%), manures and fertilizers (44.17%) and varieties recommended (40.83%). The probable reason for this might be disease identification was an important practice specially performed in tomato cultivation.

Table 2. Knowledge level of tomato growers towards improved tomato cultivation practices

(n=120)

Sl. No.	Recommended cultivation Practices	Fully Known		Not known	
		F	%	F	%
1.	Varieties recommended	49	40.83	71	59.17
2.	Sowing time	79	65.83	41	34.17
3.	Seed treatment	90	75.00	30	25.00
4.	Seed rate	77	64.17	43	35.83
5.	Field preparation	74	61.67	46	38.33
6.	Method of sowing	75	62.50	45	37.5
7.	Spacing	59	49.17	61	50.83
8.	Manures & fertilizers	53	44.17	67	55.83
9.	Methods of irrigation	69	57.50	51	42.50
10.	Weed management	55	45.83	65	54.17
11.	Disease identification	112	93.33	08	6.67
12.	Disease control	89	74.17	31	25.83
13.	Pest control	86	71.67	34	28.33
14.	Harvesting	101	84.17	19	15.83
15.	Yield	95	79.17	25	20.83

Table 3. Overall knowledge level of tomato growers towards improved tomato cultivation practices

(n=120)

S. No.	Knowledge level	Response	
		Frequency	Percentage
1.	Low	33	23.33
2.	Medium	59	49.17
3.	High	28	27.50
Total		120	100.00

Table 4. Association between socio-economic profile and knowledge level of the tomato growers

S. No.	Characteristics	'r' value
X_1	Age	-0.122^{NS}
X_2	Education	0.406**
X_3	Occupation	0.177^{NS}
X_4	Marital status	0.156^{NS}
X_5	Family size	0.094^{NS}
X_6	Size of the total land holding under tomato cultivation	0.289*
X_7	Annual income	0.204*
X_8	Social participation	0.031^{NS}
X_9	Trainings exposure	0.361*
X_{10}	Extension contact	0.367*
X_{11}	Scientific orientation	0.140^{NS}
X_{12}	Mass media exposure	0.356*

*NS = Not Significant; * = Significant at 5%, ** = Significant at 1%*

The overall knowledge level of the tomato growers towards improved tomato cultivation practices was studied and presented in Table 3.

From Table 3, it was revealed that less than half of the tomato growers in Mokokchung district had medium level of knowledge (49.17%), followed by 27.50 per cent and 23.33 per cent of them had high and low level of knowledge respectively. The findings were in accordance with the findings of Upma et al. [4], Singh et al. [1], Yadav et al. [5] and Yogendra et al. [6].

The association between the socio-economic profile and the knowledge level of the tomato growers towards improved tomato cultivation practices was studied and presented in Table 4.

From Table 4, it could be deciphered that size of the total land holding under tomato cultivation, annual income, trainings exposure, extension contact and mass media exposure had positive and significant association at 5 per cent of probability and educational status of the tomato growers had positive and significant association at 1 per cent level of probability with the knowledge level of the tomato growers about improved tomato cultivation practices. Further, age, marital status, occupation, social participation, family size, and scientific orientation, had non-significant association with the knowledge level of the farmers about improved tomato production technology. The findings were in-line with the findings of Madhuri et al. [7].

4. CONCLUSION

Based on the study, it can be concluded that higher percentage of the tomato growers possessed high school level education with land holding upto 2.5 acres and had medium level of extension agent contact. The present study reported that nearly half of the farmers belong to medium knowledge category respectively. So, there is a scope for the extension system to educate the farmers about the improved package of practices to get higher yield and profits by designing an appropriate extension strategies like training, demonstrations, exhibitions, field days, field visits etc. Majority of tomato growers partially adopted the critical practices such as, FYM, chemical fertilizers and plant protection measures. Hence Suitable assistance from extension agencies is essentially required in motivating the growers to realize the importance of these critical practices to improve the production of tomato. In the tribal regions, community radio system may be helpful to provide the useful and necessary information for tomato cultivation in their local language.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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