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KNOWLEDGE LEVEL OF SUGARCANE GROWERS ABOUT RECOMMENDED SUGARCANE CULTIVATION TECHNOLOGIES

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ABSTRACT

The present study was conducted in Navsari and Surat district of South Gujarat. Sample of 160 respondents were selected by simple random sampling technique for the study purpose. The ex-post facto research design was used for the research study. The purpose of this study was to find out the level of knowledge of the respondents about recommended sugarcane cultivation technologies. Response of the sugarcane growers was taken by personnel interview schedule. After the analysis of the collected data it observed that, the overall knowledge of sugarcane growers about recommended sugarcane cultivation technologies was found (66.91 %). The sugarcane growers had high knowledge regarding planting season (89.06 %), followed by preparatory tillage (79.37 %), planting method (78.75 %), improved variety (76.25 %), seed rate (74.68 %), and water management (68.75 %). While sugarcane growers had moderate knowledge of spacing (63.12 %), intercultural operation (62.18 %), set treatment (61.25 %), disease and pest management (60.31 %), fertilizer management (57.81 %), harvesting (57.18 %), intercropping (55.00 %) and bio fertilizer (53.12 %). The result also indicate that more than half (55.62 %) of the sugarcane growers had medium, (22.50 %) had high and (21.87 %) had low level of knowledge about recommended sugarcane cultivation technologies. The study revealed that, out of fourteen independent variables, ten viz.: age, education, source of information, social participation, innovativeness, risk orientation, market orientation, land holding, annual income and scientific orientation are found positive and significant related, while Farming experience found negative significant related, while area under sugarcane , extension contact are found positive non-significant and only resource availability is found negative non-significant relationship with knowledge about recommended sugarcane cultivation technologies

Keywords: *knowledge, sugarcane growers, recommended cultivation technologies*

INTRODUCTION

Sugarcane is one of the most important cash crops in India. Cultivation of sugarcane in India dates back to the vedic period. The earliest mention of sugarcane cultivation is found in Indian writings of the period 1400 to 1000 B.C. (Anonymous, 2023_a). Broadly there are two distinct agro-climatic regions of sugarcane cultivation in India, *viz.*, tropical and subtropical. Tropical region shared about 45.00 per cent and 55.00 per cent of the total sugarcane area and production in the country, respectively. Sub-tropical region accounted for about 55.00 per cent and 45.00 per cent of total area and production of sugarcane, respectively. It provides employment to over a million people directly or indirectly besides contributing significantly to the national exchequer. About 07.50 per cent of the rural population, covering about 60 million sugarcane farmers is dependent and a large number of agricultural labours are involved in sugarcane cultivation, harvesting and ancillary activities. The sugar industry as a whole has supported 6 million farmers and their families (The Economic Times News, 2022). Sugarcane is considered as the crop for the future because of its contribution to production of sugar, jaggery, khandsari and many by products like molasses, bagasses and press mud and also certain renewable sources of green energy in the form of bioethanol and many bio-based products However, the area under sugarcane cultivation in Gujarat in 2022-23 is approximately 181.07 ha., production 13461.26 metric tons and productivity 74343.65 kg/ha. Sugarcane is an important cash crop of South Gujarat having economical, political and sociological significance. Sugarcane is cultivated in 0.18 mha, producing 13.3 T. of cane at approximately 75 t/ha in Gujarat (Anonymous, 2023_b). South Gujarat is highly sugarcane producing region because the region has fertile land, adequate rainfall and good irrigation facilities. So, the present study was carried out for judging Knowledge level of sugarcane growers about recommended sugarcane cultivation technologies with following objective.

OBJECTIVES

(1) To study the profile and knowledge level of sugarcane growers about recommended sugarcane cultivation

technologies

(2) To ascertain the relationship between profile of sugarcane growers with knowledge level about recommended sugarcane cultivation technologies

METHODOLOGY

The present study is based on the Positivist research philosophy, which emphasizes objective measurement and statistical analysis of observable phenomena. The study assumes that knowledge regarding sugarcane cultivation technologies can be measured quantitatively through structured instruments and analyzed to identify patterns and relationships among variables. A Deductive approach was adopted for this study. The research began with established theories and concepts related to knowledge and adoption of agricultural technologies. Hypotheses and assumptions were derived from these theoretical foundations and tested empirically using quantitative data collected from sugarcane growers. The study employed a Quantitative research methodology, as it primarily relied on numerical data collected through structured interviews and analyzed using statistical tools such as percentage, mean, standard deviation, rank, and correlation coefficient (r).

A Survey research strategy was used to collect data from the respondents. Structured interview schedules were administered personally to sugarcane growers to gather primary data regarding their knowledge about recommended sugarcane cultivation technologies. The study followed a Cross-sectional research design, as the data were collected at a single point in time from the selected respondents rather than over an extended period. The study was conducted in the South Gujarat region, which consists of seven districts—Surat, Navsari, Valsad, The Dangs, Tapi, Bharuch, and Narmada. Out of these, Navsari and Surat districts were selected randomly for the present investigation. The Navsari district comprises six talukas, out of which Navsari and Gandevi talukas were selected randomly. The Surat district consists of ten talukas, from which Bardoli and Kamrej talukas were selected randomly. From each selected taluka, four villages were chosen randomly, resulting in a total of sixteen villages—eight from Navsari district and eight from Surat district. Thus, a total of 160 sugarcane growers were selected as respondents for the study.

The study employed an Ex-post facto research design, as the variables under study had already occurred and were studied without manipulation. A total of fourteen independent variables and one dependent variable were considered for the present investigation. In accordance with the study objectives, a structured interview schedule was prepared and administered personally to the respondents at their homes and fields. The collected data were coded, tabulated, and analyzed using Microsoft Excel and SPSS software. The statistical measures used included percentage, mean, standard deviation, rank, and Karl Pearson's correlation coefficient (r). The knowledge level of sugarcane growers regarding recommended sugarcane cultivation technologies was measured using a structured scale. Respondents were asked to provide their understanding, information, and opinions on specific statements. Each response was recorded on a three-point continuum: Complete – Score 2, Partial – Score 1, Nil – Score 0

The knowledge score of each respondent was computed based on their responses. Based on the mean knowledge score, the respondents were categorized into three groups: Low, Medium, and High levels of knowledge. The frequency and percentage of respondents in each group were calculated. To determine the overall level of knowledge, the mean percent score was computed and ranked accordingly. The Karl Pearson's correlation coefficient (r) was applied to study the relationship between the profile characteristics of the sugarcane growers and their knowledge level about recommended sugarcane cultivation technologies.

RESULTS AND DISCUSSION

Profile of sugarcane growers

Table 1: Distribution of sugarcane growers according to their profile (n = 160)

Sr. No.	Categories	*f*	%
1	**Age**		
	Young age (up to 35 years)	15	09.40
	Middle age (36 to 50 years)	76	47.50
	Old age (above 50 years)	69	43.10
2	**Education**		
	Illiterate	12	07.50
	Can read only	09	05.60
	Can read and write	19	11.90
	Primary school (Up to 8th standard)	39	24.40
	Middle school (9th to 10th standard)	45	28.10
	High school (11th to 12th standard)	28	17.50
	Graduate and above	08	05.00
3	**Land holding**		
	Up to 1 acre	09	05.60
	Up to 5 acre	47	26.40
	Up to 10 acre	45	28.10
	Up to 15 acre	26	16.20
	Up to 20 acre	19	11.90
	Above 20 acre	14	08.80

Sr. No.	Categories	*f*	%
4	**Annual income**		
	Very low (up to ₹ 50,000)	10	06.20
	Low (₹ 50,001 to ₹ 1,00,000)	25	15.60
	Medium (₹ 1,00,001 to ₹ 1,50, 000)	14	08.80
	High (₹ 1,50,001 to ₹ 2,00,000)	27	16.90
	Very high (above ₹ 2,00,000)	84	52.50
5	**Source of information**		
	Low (< 35.99 score)	32	20.00
	Medium (35.99 to 65.16 score)	94	58.80
	High (> 65.16 score)	34	21.20
6	**Farming experience**		
	Low (< 13.78 score)	22	13.80
	Medium (13.78 to 36.22 score)	111	69.40
	High (> 36.22 score)	27	16.90
7	**Social participation**		
	No participation	12	07.50
	Member in one organization	86	53.80
	Member in more than one organization	57	35.60
	Membership with office bearer	05	03.10
8	**Area under sugarcane crop**		
	Low (< 01.80 score)	10	06.25
	Medium (01.80 to 04.57 score)	118	73.75
	High (> 04.54 score)	32	20.00
9	**Innovation**		
	Low (< 01.54 score)	30	18.75
	Medium (01.54 to 04.31 score)	102	63.75
	High (> 04.31 score)	28	17.50
10	**Extension contact**		
	Low (< 13.81 score)	26	16.20
	Medium (13.81 to 22.78score)	103	64.40
	High (> 22.78 score)	31	19.40
11	**Scientific orientation**		
	Low (< 11.99 score)	22	13.80
	Medium (11.99 to 21.68 score)	109	68.10
	High (> 21.68 score)	29	18.10
12	**Risk orientation**		
	Low (< 11.57 score)	31	19.37
	Medium (11.57 to 20.74 score)	92	57.50
	High (> 11.57 score)	37	23.13
13	**Market orientation**		
	Low (< 13.88 score)	24	15.00
	Medium (13.88 to 21.95 score)	105	65.62
	High (> 21.95 score)	31	19.37
14	**Resource availability**		
	Low (< 11.57 score)	38	23.75
	Medium (11.57 to 20.73 score)	89	55.62
	High (> 20.73 score)	33	20.63

The data in Table 1 indicated that less than half (47.50 %) of the sugarcane growers belonged to middle age group followed by old age 43.10 per cent and young age group 09.40 per cent. From the above discussion, it can be concluded that most of the sugarcane growers belonged to middle to old age group (47.50 %) *i.e.*36 and above years. The probable reason might be that, old growers were wide farming experience and they also transfer their occupation to an elder son. Young age growers might engaged either in educational activities on diverted towards service sector. The similar findings have been reported by Raval (2020), Patra *et al.* (2021), Shukla *et al.* (2023) and Kachchhava *et al.* (2023).

The data in the Table 1 revealed that less than one-third (28.10 %) of the growers were educated up to middle school. On the other hand, 24.40 per cent growers had primary school level education, 17.50 per cent growers had high school level education, 11.90 per cent growers can read and write, 07.50 per cent growers are literate, 05.60 per cent growers can read only and only 05.00 per cent growers were found to be graduate and above. It can be interpreted from above findings that nearly three fifth (52.50 %) of the sugarcane growers had primary to middle school level education. The probable reason might be that middle school education was available in the village or near their villages. The similar findings have been reported by Shukla *et al.* (2023) and Shepra *et al.* (2023).

The data in Table 1 indicated that less than one third (28.10 %) of sugarcane growers had up to 10 acre land holding, while 26.40 per cent sugarcane growers had up to 5 acre land holding. The growers with up to 15 acre, up to 20 acre, above 20 acre and up to 1 acre were 16.20, 11.90, 08.80 and 05.60 per cent, respectively. It is thus, concluded that majority (70.70 %) of the growers were from land holding up to 5 acre to 15 acre land holding. The probable reason for this might be due to the fragmentation of land holding among the members of family. The similar findings have been reported by Shepra *et al.* (2023).

The data presented in Table 1 indicated that more than half (52.50 %) of the sugarcane growers had very high annual income, while 16.90 per cent of the sugarcane growers had high annual income and 15.60 per cent of the sugarcane grower were having low annual income. Whereas, 08.80 per cent of the sugarcane growers had medium annual income. Only 06.20 per cent of sugarcane growers having very low annual income. It can be concluded that less than three fourth (69.40 %) of growers had very high to high annual income. The probable reason for this might be sugarcane is a cash crop. Sugarcane is also a low-risk crop as compared to other crops. Farmers got a fixed amount of FRP from sugar mills every year, ensuring a consistent level of income. The similar

findings have been reported by Vithalkar (2021).

The data presented in Table 1 revealed that more than half (58.80 %) of the sugarcane growers had medium level utilization of sources of information, while 21.20 and 20.00 per cent of them had high and low level of utilization of sources of information, respectively. It can be concluded that majority of sugarcane growers had medium level of utilization of sources of information. The probable reason for this might be the easy accessibility of these information sources as these are locally available sources hence they might have approached easily. This may be due to the fact that farmers can now easily access and get information on various subjects by using their personal, cosmopolite and other sources of information. The similar findings have been reported by Vithalkar (2021).

The distribution of the sugarcane growers according to their farming experience is presented in Table 1. It revealed that majority (69.40 %) of the sugarcane growers had medium level of farming experience, followed by 16.90 per cent had high level of farming experience and 13.80 per cent of respondents belonged to lower farming experience category. The above results can be understood that majority of sugarcane growers belong to middle age group and also there was awareness among the farming community about the education which made them to enter into farming after completing their education. The similar findings have been reported by Hiwarale (2023) and Jadhav *et al.* (2023).

The data in Table 1 indicated that more than half (53.80 %) of the sugarcane growers were members in one organization. While 35.60 per cent of the sugarcane growers were member in more than one organization and 07.50 per cent of the sugarcane growers could not associated with any social organization. Only 03.10 per cent of the sugarcane growers were found holding position in various organizations. The above data indicated that majority of the sugarcane growers (89.40 %) had membership in social organization. The possible reason might be that in all the villages under study have atlist one milk co-operative society because in study area network of Sumul in Surat district and Vasundhra in Navsari district is well spread across the study area. Moreover many villages had farmers' cooperative societies self-help groups and other farmers based association and religious institutions were also working in study area. The similar findings have been reported by Sherpa et al. (2023) and Shukla *et al.* (2023).

The data presented in Table 1 indicated that out of total size of land holding, majority (73.75 %) of the sugarcane growers were having medium area under sugarcane cultivation, followed by 20.00 and 06.25 per cent were having high and low area under sugarcane cultivation, respectively.

The data in Table 1 showed that more than three-fifth (63.75 %) of the sugarcane growers had medium innovativeness, followed by 18.75 and 17.50 per cent of the growers had low and high innovativeness, respectively. It is concluded that majority of the farmers had medium innovativeness. This might due to the fact the majority of the growers were having medium extension participation and medium exposure to various information sources that might have helped them to become innovative. The similar findings have been reported by Rathwa *et al.* (2021).

From the above Table 1 is indicated that less than two third (64.40 %) of sugarcane growers had medium extension contact, followed by 19.40 and low 16.20 per cent of the growers had high and low extension contact, respectively. It can be pointed out that majority of the sugarcane growers had medium level of extension contact. It is obvious that the contact with extension agency as well as participation in various extension activities would certainly help sugarcane growers to acquire more knowledge of sugarcane cultivation technologies. The similar findings were also reported by Vithalkar (2021), Damor *et al.* (2021), Hiwarale *et al.* (2023) and Jadhav *et al.* (2023).

From the above Table 1, it is evident that more than two third of (68.10%) sugarcane growers had medium scientific orientation, followed by 18.10 and 13.80 per cent sugarcane growers had high and low scientific orientation, respectively. From the above result it can be inferred that the majority (86.20 %) of sugarcane growers had medium to high degree of inclination towards encountering risk. Further, majority of the growers were medium aged and illiterate with stereotypic mentality and less enthusiastic to know the things scientifically. This finding is in accordance with the findings of Lakkad (2023).

From the above Table1, it is evident that more than half (57.50 %) of the sugarcane had medium risk orientation, followed by 23.13 and 19.37 per cent sugarcane growers had high and low risk orientation, respectively. The result presented above obviously inferred that sugarcane growers had medium to high risk orientation. The reason might be that respondents had comparatively higher annual income which might make them capable to take the risk of uncertainty in agriculture. Moreover, respondents might believe that one must take some risk to achieve something. This finding is in accordance with the findings of Sardhara *et al*. (2020) and Rathwa *et al.* (2021).

The data in Table 1 clearly indicated that nearly two third (65.62 %) of the sugarcane growers had medium

level of market orientation followed by 19.38 and 15.00 per cent sugarcane growers had high and low level of market orientation, respectively. The most likely explanation for this is that sugarcane growers were always involved in farming activities and had limited free time to join in various social organizations or attend programs. They only take part when it is crucial in light of their interests and needs. As a result, the majority of sugarcane growers fell into the category of medium social participation. This finding is in accordance with the findings of Raval (2020).

Knowledge index of sugarcane growers about recommended sugarcane cultivation technologies

Table 2 : Practices wise knowledge level of the sugarcane growers regarding the recommended sugarcane cultivation technologies (n = 160)

Sr. No.	Practices	Total score	Obtained score	Knowledge level (%)	Rank
1	**Preparatory tillage**	320	254	79.37	II
2	**Improved varieties**	320	244	76.25	IV
3	**Planting season**	320	285	89.06	I
4	**Spacing**	320	202	63.12	VII
5	**Seed rate**	320	239	74.68	V
6	**Set treatment**	320	196	61.25	IX
7	**Planting method**	320	252	78.75	III
8	**Intercultural operations**	320	199	62.18	VIII
9	**Fertilizer management**	320	185	57.81	XI
10	**Bio fertilizer**	320	170	53.12	XIV
11	**Water management**	320	220	68.75	VI
12	**Intercropping**	320	176	55.00	XIII
13	**Disease and pest management**	320	193	60.31	X
14	**Harvesting**	320	183	57.18	XII
Total		**4480**	**2298**	**66.91**	

It is evident from the Table 2 that overall knowledge of sugarcane growers about recommended sugarcane cultivation technologies was found 66.91 per cent. Chronologically knowledge of recommended sugarcane cultivation technologies was also calculated where the highest knowledge (89.06 %) in planting season, followed by preparatory tillage (79.37 %), planting method (78.75 %), improved variety (76.25 %), seed rate (74.68 %) and water management (68.75 %). While sugarcane growers had moderate knowledge of spacing (63.12 %), intercultural operation (62.18 %), seed treatment (61.25 %), disease and pest management (60.31 %), fertilizer management (57.81 %), harvesting (57.18 %), intercropping (55.00 %) and bio fertilizer (53.12 %).

Knowledge of sugarcane growers about recommended sugarcane cultivation technologies

Table 3: Distribution of the sugarcane growers according to their level of knowledge about the recommended sugarcane cultivation technologies (n = 160)

Sr. No.	Level of adoption	*f*	%
1	**Low** (< 13.66 score)	35	21.87
2	**Medium** (13.66 to 23.71 score)	89	55.62
3	**High** (> 23.71 score)	36	22.50

The result in Table 2 indicates that more than half

(55.62 %) of the sugarcane growers had medium level of knowledge. On the other hand, 22.51 per cent of sugarcane growers were found having high level of knowledge and 21.87 per cent of sugarcane growers fall under the category of low level of knowledge of sugarcane cultivation technologies. Results were contrary to Subhash, V. (2020), Paradva *et al.* (2021), Abhishek *et al.* (2023) and Saini *et al.* (2023); Chauhan et al. (2025); Sanjay et al. (2024); Agarwal et al. (2024); Sanjay et al. (2024); Pratik and Vinaya (2022); Mallappa et al. (2023).

Association between profile of sugarcane growers with knowledge about recommended sugarcane cultivation technologies

The data presented in Table 4 revealed that age (0.337), education (0.349), source of information (0.222), social participation (0.435), innovativeness (0.213), risk orientation (0.439), market orientation (0.439) showed positive and highly significant relationship. On other hand land holding (0.159), annual income (0.192), scientific orientation (0.172) are found positive and significant relationship with knowledge about recommended sugarcane cultivation technologies. Farming experience (-0.162) found negative significant relationship while area under sugarcane (0.147), extension contact (0.144) are found positive non-significant and only resource availability (-0.057) is found negative non-significant relationship with knowledge about recommended sugarcane cultivation technologies.

Table 4: Association between profile of sugarcane growers with knowledge level about recommended sugarcane cultivation technologies (n = 160)

Sr. No.	Independent variables	Coefficient of correlation (r)
X_1	**Age**	0.337**
X_2	**Education**	0.349**
X_3	**Land holding**	0.159*
X_4	**Annual income**	0.192*
X_5	**Source of information**	0.222**
X_6	**Farming Experience**	-0.162*
X_7	**Social participation**	0.435**
X_8	**Area under sugarcane**	0.147^{NS}
X_9	**Innovativeness**	0.213**
X_{10}	**Extension contact**	0.144^{NS}
X_{11}	**Scientific orientation**	0.17*
X_{12}	**Risk orientation**	0.439**
X_{13}	**Market orientation**	0.439**
X_{14}	**Resource availability**	-0.057^{NS}

** = Significant at 0.01 level
* = Significant at 0.05 level NS = Non-Significant

CONCLUSION

On the basis of findings it can be concluded that majority of the sugarcane growers had medium level of knowledge about recommended sugarcane cultivation technologies. Sugarcane growers had high level of knowledge regarding planting season followed by preparatory tillage, planting method, improved variety, seed rate, water management. While sugarcane growers had moderate knowledge of spacing, intercultural operation, seed treatment, disease and pest management, fertilizer management, harvesting, intercropping and bio fertilizer. On the basis of findings it can be concluded that independent variables like age, education, source of information, social participation, innovativeness, risk orientation, market orientation showed positive and highly significant relationship. On other hand land holding, annual income, scientific orientation are found positive and significant relationship with knowledge about recommended sugarcane cultivation technologies. Farming experience found negative significant relationship while area under sugarcane, extension contact are found positive non-significant and only resource availability is found negative non-significant relationship with knowledge about recommended sugarcane cultivation technologies.

RECOMMENDATIONS

(1) The State Department of Agriculture, State Agricultural University and other NGOs and co-operative sugar factories to conduct the demonstrations and training programme on large scale to provide required knowledge about recommended sugarcane cultivation technologies to sugarcane growers

(2) It is imperative that State Department of Agriculture, State Agricultural University and other NGOs and co-operative sugar factories to conduct the demonstrations and training programme on large scale to provide required knowledge about recommended sugarcane cultivation technologies to sugarcane growers.

(3) The relationship of profile of sugarcane growers and dependent variables should be considered while planning and implementation of the knowledge enhancing programmes for sugarcane growers in the South Gujarat.

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CONFLICT OF INTEREST

This is to declare that there is "No conflict of interest" among researcher.

REFERENCES

Abhishek, S.; Vyas, H. U. and Dhandhukiya, R. D. (2023). Knowledge and adoption of recommended cultivation practices of pigeon pea growers. *Gujarat Journal of Extension Education,* 36(1): 42-43.

Agarwal, D., Chahal, P. K., Mukteshwar, R. (2024) Ascertaining the technological GAP in adoption of sugarcane production technology. *Gujarat Journal of Extension Education,* 38(1):35-40. https://doi.org/10.56572/gjoee.2024.38.1.0007.

Anonymous (2023_a). National Food Security Mission, Government of India, www.nfsm.gov.in: https://www.nfsm.gov.in/BriefNote/BN_Sugarcane.pdf

Anonymous, (2023_b). Directorate farmers walfare and co-operation department Government of Gujarat. Retrieved from dag.gujarat.gov.

Chauhan, Y. R., Khodifad, P. B. and Patel, R. A. (2025) Technological gap and its relationship with profile characteristics of sugarcane growers in recommended sugarcane cultivation technologies. *Gujarat Journal of Extension Education,* 39(2): 178–188. https://doi.org/10.56572/gjoee.2025.39.2.0029

Damor, C. B.; Rathod, D. M. and Chauhan, C. D. (2021). Knowledge and adoption of recommended scientific practices of castor growers about castor cultivation. *Gujarat Journal of Extension Education,* 32(1): 16-19.

Hiwarale, A. S.; Manvar, V. S.; Kadam, R. P.; Hadolikar, S. D. and Gohade, G.R. (2023). Relationship between the profile of sweet orange growers with their extent of technological gap. *The Pharma Innovation Journal,* 12(1): 1438-1441.

Jadhav, R. R.; Puri, S. G. and Rajput, M. O. (2023). Profile characteristics of pomegranate cultivators. *The Pharma Innovation Journal,* 12(2): 279-282.

Kachchhava, T. L.; Patel, J. K. and Parmar H. A. (2023). Technological gap and its relationship with selected characteristics of muskmelon growers in recommended muskmelon production technology. *Gujarat Journal of Extension Education,* 35(1): 16-21.

Lakkad, V. (2023). Knowledge and adoption of growers about plant protection practices of paddy crop in Valsad district of Gujarat State. *Thesis M.Sc. (Agri.),* Navsari Agricultural University, Navsari. Gujarat.

Mallappa, V.K.H., Panigrahy, S.R., Nayak, A.K.; Pundir, R. S.; Kumari, P. (2023) Factors Influencing the Knowledge Level of Fish Consumers: An Explanatory Analysis. Sustainability 2023, 15, 10183. https://doi.org/10.3390/su151310183

Paradva, V. B.; Patel, M. R. and Patel, P. C. (2021). Knowledge of the green gram growers towards recommended green gram production technology. *Gujarat Journal of Extension Education,* 32(1): 158-161.

Patra, N. K. and Kense, P. U. (2021). Study on knowledge and adoption of improved cultivation practices of mandarin growers in Nagaland, India. *Indian Journal of Extension Education,* 56(4): 126-133.

Pratik Kiritkumar Patel and Vinaya Kumar, H. M. (2022). Predictive Factors for Farmers' Knowledge of Social Media for Sustainable Agricultural Development. *Indian Journal of Extension Education*, 58 (4): 55-59. http://doi.org/10.48165/IJEE.2022.58412

Rathwa, Y. H.; Bochalya, B. C. and Reddy, S. Y. (2021). Knowledge of cotton growers about integrated pest management. *Gujarat Journal of Extension Education,* 32(1): 165-167.

Raval, K. N. (2020). Knowledge of potato production technology and backward-forward linkages of potato growers of Aravalli district. *Thesis, M.Sc. (Agri.),* Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Gujarat.

Saini, A.; Sharma, P. and Iqbal, T. (2023). A Study on knowledge level of farmers regarding paddy straw management in Punjab, India. *Asian Journal of Agricultural Extension, Economics and Sociology,* 41(2): 26-30.

Sanjay, V. C., Mondal, S. and Demila, T. (2024) Nexus between socio-contextual factors and crisis awareness of sugarcane growers. *Gujarat Journal of Extension Education,* 38(2):139-143. https://doi.org/10.56572/gjoee.2024.38.2.0022.

Sardhara A. D., Jadav N. B. and Kapuriya, T. D. (2020). Relationship of technological gap in adoption of plant protection practices with socio-economic characteristics of cotton growers. *Gujarat Journal of Extension Education*, 31(1): 24-45.

Sherpa, T. P.; Rana, P.; Sharma, P. and Samriti, J. (2023). A study on socio-economic status of tomato growers in Solan district of Himachal Pradesh. *Asian Journal of Agricultural Extension, Economics and Sociology,* 41(3): 35-41.

Shukla, S. K.; Shukla, P.; Tiwari, A. K. and Singh, Y. K. (2023). Socio-economic profile of sugarcane farmers of Basti district. *The Pharma Innovation Journal*, 12(1): 3131-3138.

Subhash, V. (2020). A study on knowledge and adoption of betel vine (piper betel) cultivation practices followed by the farmers of Devanagari district of Karnataka. *Thesis M. Sc. (Agri.),* University of Agriculture and Horticulture Science, Shivamogga, Karnataka

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