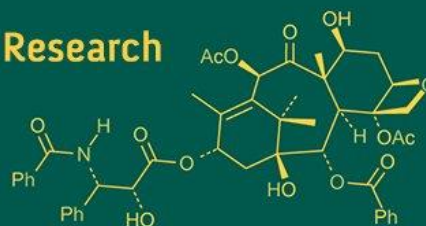


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Performance Analysis of Sugarcane Growers in Vijayapura District of Karnataka

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Abstract

Sugarcane cultivation contributes substantially to farm income and rural livelihoods in Karnataka, but differences in farm resources, technology adoption and access to extension services may result in varying levels of farmer performance. The present study was conducted in Vijayapura district to assess the production, economic and social performance of sugarcane growers and examine the relationship of personal, socio-economic and psychological characteristics with performance. An ex-post facto research design was followed in Indi and Sindagi taluks, from which six villages were purposively selected. A total of 120 sugarcane growers, comprising 60 small and 60 big farmers, were selected through proportionate random sampling. Data were collected using a structured interview schedule and analysed using frequency, percentage, mean, standard deviation, correlation analysis and Z-test. The findings revealed that 50.00 per cent of the growers had medium production performance, while 43.33 and 38.34 per cent had medium economic and social performance, respectively. Overall, 45.00 per cent of the growers belonged to the medium performance category, followed by high (28.34%) and low (26.66%) categories. Big farmers recorded significantly higher performance than small farmers, with mean ranks of 53.67 and 45.26, respectively ($Z=3.95^{**}$). Education, annual income, family type, achievement motivation, risk orientation, economic motivation, scientific orientation, cosmopolitanism, extension contact, mass media exposure and extension participation showed significant positive relationships with performance, whereas age, family size and farming experience were non-significant. The findings emphasize the need for strengthening extension support, timely input availability and need-based capacity-building interventions, particularly among small farmers, to enhance technology adoption, productivity and economic returns from sugarcane cultivation.

Keywords: Sugarcane growers, Production performance, Economic performance, Social performance, Small farmers, Big farmers

Introduction

Agriculture stands as one of the most pivotal sectors of the Indian economy and serves as the primary source of livelihood for nearly two-thirds of the country's population. The sector occupies about 43 per cent of India's geographical area and contributes approximately 18.3 per cent to the national Gross Domestic Product (Anonymous, 2022) [2]. Indian agriculture is characterized by the cultivation of a wide range of crops, including food crops, oilseeds, pulses, and commercial crops. Among these, sugarcane occupies a prominent position due to its significant contribution to rural employment, agro-industrial development, and farm income. Sugarcane is one of the most important commercial crops grown in India and forms the backbone of the sugar industry, which is the second largest agro-based industry in the country after cotton. The importance of sugarcane and the sugar industry to the Indian economy is evident from the fact that it supports the livelihoods of over five crore farmers and their dependents. India is the biggest consumer and the second largest producer of sugar in the world. The average annual production of sugarcane in the country is around 35.5 crore metric tonnes, which is utilized to produce nearly three crore metric tonnes of sugar. Domestic sugar consumption was estimated at about 2.6 crore metric tonnes during 2020-21 (Anonymous, 2021) [1]. Sugarcane is cultivated over an area of approximately 5.09 million hectares, producing about 430.50 million metric tonnes with an average productivity of 82.50 tonnes per hectare (Anonymous, 2021) [1]. The major sugarcane-growing states in India include Uttar Pradesh, Maharashtra, Karnataka, Tamil Nadu, and Bihar, which together

account for nearly 90 per cent of the total sugar production in the country. Karnataka ranks third in sugarcane production after Uttar Pradesh and Maharashtra. In Karnataka, sugarcane is cultivated over an area of 4.23 lakh hectares, with a production of 420.9 lakh metric tonnes and an average productivity of 96 tonnes per hectare (Anonymous, 2021) ^[1]. Vijayapura district is one of the important sugarcane-growing regions in the state, covering an area of 38,920 hectares and supported by the presence of a sugar factory. The district records a production of 4.32 lakh tonnes with a productivity of about 79 tonnes per hectare (Anonymous, 2021) ^[1]. Although sugarcane productivity has shown an increasing trend over the years, the magnitude of improvement has remained marginal, and a wide gap persists between potential and realized yields. This gap is attributed to factors such as environmental constraints, inappropriate cropping systems, limited use of recommended varieties, imbalanced fertilizer application, pest and disease incidence, and several socio-economic and institutional constraints. Despite the availability of improved and proven sugarcane production technologies, their adoption at the farm level remains uneven, resulting in low productivity and economic performance (Kamta Prasad *et al.*, 2022) ^[3]. Therefore, assessing the performance of sugarcane growers and the factors influencing the adoption of recommended production technologies is crucial for improving productivity, profitability, and sustainability of sugarcane cultivation in Vijayapura district.

Materials and Methods

The study was conducted in Vijayapura district of Karnataka, which is recognized as one of the major sugarcane-producing districts of the state. The district was selected purposively due to the extensive cultivation of sugarcane across its taluks, namely Vijayapura, Basavana Bagewadi, Indi, Muddebihal and Sindagi. Among these, Indi and Sindagi taluks were purposively selected for the present investigation as they account for a comparatively largest area under sugarcane cultivation. From each selected taluk, three villages having high sugarcane cultivation potential were identified, resulting in a total of six villages for the study. An ex-post facto research design was employed, as the performance of sugarcane growers had already occurred and the independent variables were beyond the control of the researcher. This design was considered appropriate for examining relationships among variables without manipulation. From each selected village, 20 sugarcane growers were selected using proportionate random sampling, comprising 10 small and 10 big farmers. Thus, a total sample of 120 sugarcane growers was drawn from two taluks and six villages. Primary data were collected using a structured interview schedule developed in consultation with experts from the disciplines of Agricultural Extension and Agronomy. The schedule covered all variables relevant to the study and was pre-tested to ensure clarity and reliability. The collected data were coded, tabulated, and analyzed using appropriate statistical tools. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to summarize the data, while inferential techniques including correlation analysis and Z-test were employed to examine relationships among variables and test statistical significance. The performance of sugarcane growers was assessed across production, economic, and social

dimensions. Production performance was measured through knowledge of recommended agronomical practices and the extent of adoption of these practices. Economic performance was assessed based on average profitability from sugarcane cultivation and categorized into low, medium and high-performance levels. Social performance was measured using five continuum statements reflecting farmers' social participation, organizational involvement, and contribution to society.

Results and Discussion

A. Performance of Sugarcane growers

The study revealed that overall performance of small and big farm sugarcane growers, more than two fifth (45.00%) of sugarcane growers belongs to medium performance category, followed by high (28.34%) and low (26.66%) performance respectively, in case of small farmers more than two fifth (43.34%) of farmers belongs to low overall performance level, followed by medium (40.00%) to high (16.66%) performance. with respect to big farmers, half (50.00%) of the sugarcane growers fall under medium level of extension participation, followed by high (40.00%) and low (10.00%) level of performance (Elenchezian, *et al.*, 2024) ^[6]. (Fig 1). However, Overall performance (which includes production, economic and social performance) is affected by education level, along with their farming experience, annual income, extension contact, willingness to gather more information regarding farming and social participation may be the major reasons for the above trend (Rakesh B. L *et al.*, 2025) ^[5] (Table 1).

Production performance was assessed using two components, namely the extent of adoption and the level of knowledge regarding recommended sugarcane agronomical practices. From Table 1 it can be observed that, half (50.00%) of the sugarcane farmers belonged to medium level production performance category followed by low (26.66%) and high (23.34%) performance category, respectively. In case of small sugarcane farmers, more than half (51.67%) fall under medium category of production performance followed by low (36.66%) and high (11.67%) production performance category. With respect to big sugarcane farmers, more than two-fifth (48.34%) of them belonged to medium category followed by high (35.00%) and only 16.66 per cent of them belongs to low production performance category (Fig1) (Lavanya Raj and Aski. 2019) ^[9] (Singh and Shma.). The predominance of medium to low production performance among small farmers may be attributed to inadequate knowledge of recommended cultivation practices, delayed or limited access to quality inputs, and weak motivation to adopt improved technologies. Big farmers showed comparatively better performance, reflecting the role of extension contact, participation in extension activities, and mass media exposure in enhancing technology use (Pinaki Roy. *et al.*, 2022) ^[4]. Overall, 76.66 per cent of sugarcane growers exhibited medium to low production performance, highlighting the need for strengthened extension interventions, targeted capacity-building programmes, and timely input supply to improve adoption and productivity levels (Khushi Singh and Jahanara, 2024) ^[8].

The data presented in Table 1 illustrate the economic performance of sugarcane growers. A little over two-fifths (43.33%) of the growers exhibited a medium level of economic performance, followed by low (30.83%) and high

(25.84%) levels, respectively. Among small farmers, 45.00 per cent belonged to the low economic performance category, while 41.66 per cent and 13.34 per cent fell under the medium and high categories, respectively. The relatively lower economic performance of small farmers may be attributed to their limited adoption of recommended sugarcane production technologies, which restricts the realization of maximum profitability. In contrast, a majority of big farmers (451.00%) exhibited medium economic performance, followed by high (38.34%) and low (16.66%) performance categories (Ganesh prasad. *et al.*, 2011)^[7] (Fig 3). This comparatively better economic performance among big farmers may be due to higher production efficiency achieved through the adoption of recommended practices, greater participation in extension activities, and regular extension contact with line department officials, all of which contribute to increased net income.

Overall, most sugarcane growers belonged to the medium to low economic performance categories. Although sugarcane is a remunerative commercial crop, higher profitability Bigly depends on the adoption of improved cultivation practices. Enhanced economic performance contributes to an improved standard of living and upward socio-economic mobility, which, in turn, motivates farmers to adopt improved technologies. Furthermore, socio-economic characteristics such as landholding size, annual income, and extension participation might have significantly influenced the economic performance of the sugarcane growers.

With respect to the pooled data, nearly two-fifths (38.34%) of the sugarcane growers belonged to the medium level of social performance, followed by high (31.66%) and low (30.00%) categories. Among small sugarcane farmers, three-fourths (75.00%) fell under the low to medium social performance category, while only 25.00 per cent exhibited high social performance. This pattern may be attributed to limited contact with extension personnel and line departments, as well as minimal involvement in organizational and community activities. Additionally, their average economic performance may restrict their capacity to actively participate in social and developmental initiatives.

In contrast, a higher proportion of large farmers demonstrated better social performance, with 41.66 per cent falling under the medium category, followed by high (38.34%) and low (20.00%) levels (Fig 4). The comparatively higher social performance of large farmers may be due to their superior production and economic performance, which enhances their socio-economic status and facilitates active participation in activities organized by various institutions. Furthermore, their desire for social recognition and respect motivates greater involvement in community and organizational affairs. Enhanced production and economic stability empower these farmers to engage more effectively in social initiatives and strengthen their social standing.

Overall, a majority of sugarcane growers belonged to the medium to high levels of social performance. This trend suggests that improvements in production and economic performance positively influence social performance by encouraging greater participation in institutional activities, enhancing community recognition, and enabling investments in education and social development. Consequently, socio-economic advancement plays a pivotal role in shaping the social engagement and influence of sugarcane growers within their communities.

B. Comparison between small and big farm sugarcane growers

The results of the Z test from the Table 2 revealed that there was a positive and significant difference between performance of small and big farm sugarcane growers at one per cent level. The mean score of big farmers was high (53.67) when compared to small farmers (45.26) which shows the significant difference among both the sugarcane growers.

The probable reason might be that, knowledge level and timely adoption of some of the improved production practices among the big farm sugarcane growers was better compare to small farm sugarcane growers. The exposure to mass media, contact with extension personnel, urge to achieve in order to get better standard of living and better management of available resources indirectly influenced the overall performance of the big farmers. Improved sugarcane practices which could contribute to the stabilized economic performance and also maximize the resource use efficiency. In total, the significant difference in performance between the small and big farm sugarcane growers highlights the considerable benefits associated with enhanced nutrient management, effective pest and disease control, sets treatment, and the adoption of intercultural farming practices. These findings underscore the potential advantages of implementing such agricultural techniques to enhance farmers' performance and promote long-term agricultural sustainability.

C. Relationship between personal, socio-economic and psychological characteristics of Sugarcane growers with their performance level

Correlation analysis was carried out to examine the relationship between personal, socio-economic, and psychological characteristics of sugarcane growers and their overall performance. Among small farmers, family type and cosmopolitaness exhibited a positive and significant relationship with performance at the one per cent level, while education, annual income, achievement motivation, risk orientation, economic motivation, scientific orientation, extension contact, mass media exposure, and extension participation were significant at the five per cent level. Age, family size, and farming experience showed no significant association. In the case of big farmers, cosmopolitaness and extension participation were positively and significantly related to performance at the one per cent level. Education, annual income, family type, achievement motivation, risk orientation, economic motivation, scientific orientation, extension contact, and mass media exposure were significant at the five per cent level, whereas age, family size, and farming experience were non-significant.

Considering pooled data, family type, cosmopolitaness, and extension participation showed a positive and significant relationship with performance at the one per cent level. Education, annual income, achievement motivation, risk orientation, economic motivation, scientific orientation, extension contact, and mass media exposure were significant at the five per cent level, while age, family size, and farming experience remained non-significant. The results indicate that education enhances farmers' ability to understand and apply improved technologies, while higher income facilitates investment in recommended practices. Achievement motivation, risk orientation, economic motivation, and scientific orientation promote technology

adoption and efficient resource use (Jadhav. *et al.*, 2025) ^[12]. Regular extension contacts, participation in extension activities, and exposure to mass media improve access to information and decision-making. Family type and

cosmopoliteness strengthen resource sharing, social interaction, and institutional exposure, thereby positively influencing the overall performance of sugarcane growers (Ranjeet Kumar *et al.*, 2025) ^[11].

Table 1: Performance of Sugarcane growers

Sl. No	Indicators	Category	Small farmers (n ₁ =60)		Big Farmers (n ₂ =60)		Sugarcane growers (n=120)	
			No.	%	No.	%	No.	%
1	Production performance Mean = 42.47 SD= 5.76	Low < (39.59)	22	36.66	10	16.66	32	26.66
		Medium (39.59-45.35)	31	51.67	29	48.34	60	50.00
		High > (45.35)	07	11.67	21	35.00	28	23.34
2	Economic performance Mean=223.94 SD= 21.17	Low < (213.36)	27	45.00	10	16.66	37	30.83
		Medium (213.36-234.53)	25	41.66	27	45.00	52	43.33
		High > (234.53)	08	13.34	23	38.34	31	25.84
3	Social performance Mean= 2.97 SD= 1.51	Low < (2.21)	24	40.00	12	20.00	36	30.00
		Medium (2.21- 3.73)	21	35.00	25	41.66	46	38.34
		High > (3.73)	15	25.00	23	38.34	38	31.66
4	Overall performance Mean= 89.79 SD= 6.06	Low < (86.76)	26	43.34	06	10.00	32	26.66
		Medium (86.76-93.00)	24	40.00	30	50.00	54	45.00
		High > (93.00)	10	16.66	24	40.00	34	28.34

Table 2: Comparison between small and big farmers performance

Sl. No.	Category	Mean Rank	Z value
1	Small farmers (n ₁ =60)	45.26	3.95**
2	Big farmers (n ₂ =60)	53.67	

** Significant at 1% level of significance

Table 3: Relationship between personal, socio-economic and psychological characteristics of Sugarcane growers with their performance level

Sl. No.	Independent variables	Small farmers (n ₁ =60)	Big farmers (n ₂ =60)	Sugarcane Growers (n=120)
1	Age	0.103 ^{NS}	0.122 ^{NS}	0.143 ^{NS}
2	Education	0.321*	0.229*	0.224*
3	Family size	0.139 ^{NS}	0.198 ^{NS}	0.178 ^{NS}
4	Farming experience	0.178 ^{NS}	0.059 ^{NS}	0.030 ^{NS}
5	Annual income	0.339*	0.412*	0.394*
6	Family type	0.544**	0.412*	0.556**
7	Achievement motivation	0.463*	0.384*	0.364*
8	Risk orientation	0.339*	0.364*	0.463*
9	Economic motivation	0.307*	0.276*	0.361*
10	Scientific orientation	0.293*	0.344*	0.423*
11	Cosmopoliteness	0.544**	0.542**	0.671**
12	Extension contact	0.419*	0.379*	0.482*
13	Mass media exposure	0.310*	0.420*	0.396*
14	Extension participation	0.476*	0.504**	0.589**

* Significant at 5% level

** Significant at 1% level

NS-Non significant

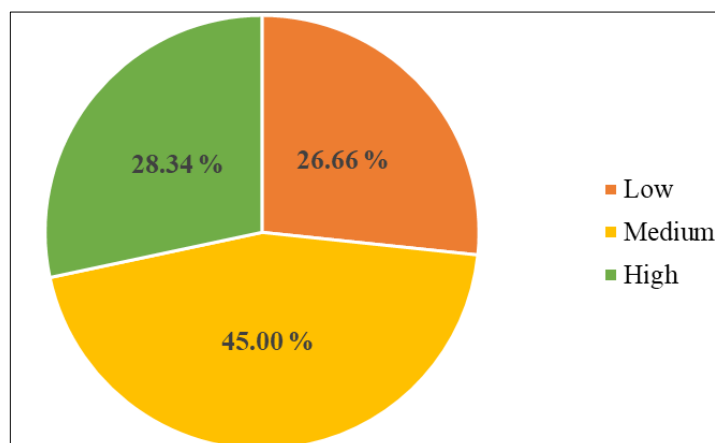


Fig 1: Overall performance of Sugarcane growers

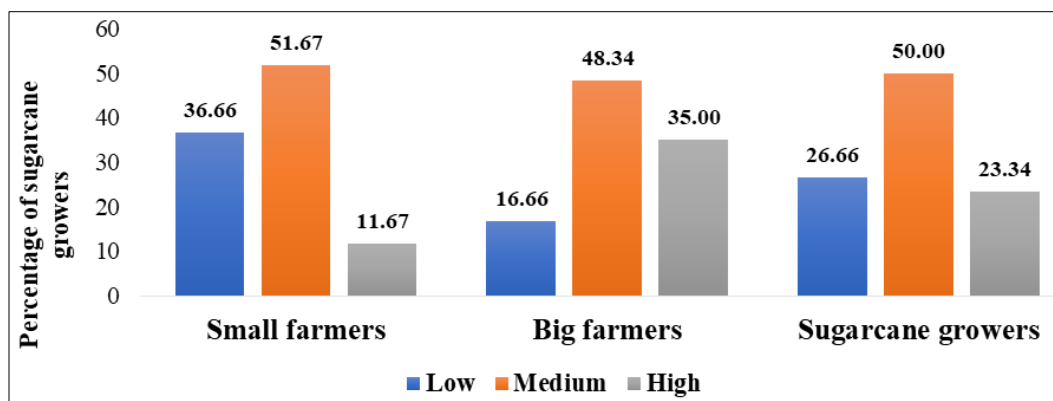


Fig 2: Production performance of sugarcane growers

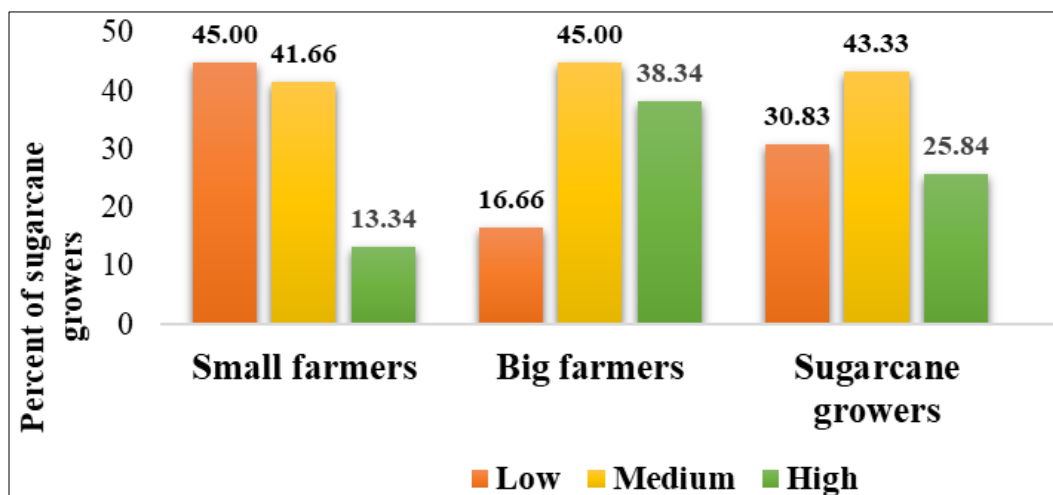


Fig 3: Economic performance of sugarcane growers

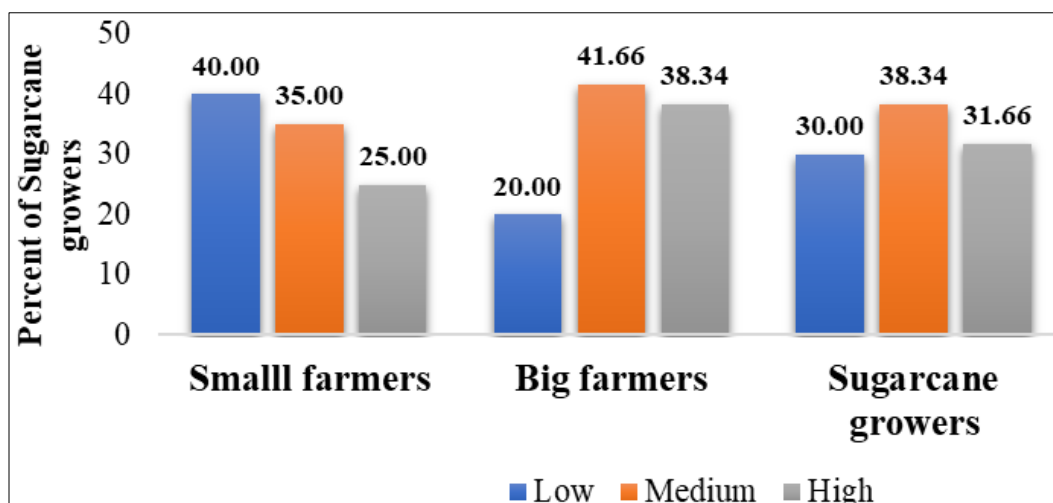


Fig 4: Social performance of sugarcane growers

Conclusion

The study revealed that the overall performance of sugarcane growers in Vijayapura district predominantly ranged from medium to low levels across production, economic, and social dimensions. Limited adoption of recommended sugarcane production technologies emerged as a major factor constraining productivity and profitability, particularly among small farmers. Correlation analysis indicated that socio-economic and psychological characteristics such as education, annual income, achievement motivation, risk orientation, economic motivation, scientific orientation, extension contact, mass

media exposure, family type, and cosmopolitaness significantly influenced the performance of sugarcane growers, while age and farming experience had no significant effect. Large farmers exhibited relatively better performance due to higher levels of technology adoption, extension participation, and resource availability. The findings underscore the critical role of effective extension services, timely input supply, and capacity-building programmes in improving farmers' performance. Strengthening institutional support and promoting need-based extension interventions can enhance adoption behaviour, productivity, and income, thereby contributing to

the sustainable development of sugarcane cultivation in the study area.

References

1. Anonymous. Commission for Agricultural Costs and Prices. Ministry of Agriculture and Farmers Welfare; 2021.
2. Anonymous. Economic Survey 2021-22. 2022.
3. Prasad K, Sankhala G, Singh RK, Singh YP, Lal B, Dohare RS, *et al.* Utilization patterns of sugarcane production technologies and factors affecting the same under sugarcane based farming system in Indo-Gangetic Plains of India. *Journal of Community Mobilization and Sustainable Development*. 2022;17(1):158-168.
4. Roy P, Hansra BS, Roy Burman R. Adoption and efficacy measurement of improved sugarcane varieties in livelihood security of lower Shivalik hills of Uttarakhand. *Journal of Community Mobilization and Sustainable Development*. 2022;17(1):182-188.
5. Rakesh BL, Guledagudda SS, Kulkarni GN, Biradar SA, Prashanth J. Dynamics of sugarcane growth and productivity in Mandya District, Karnataka, India. *Journal of Scientific Research and Reports*. 2025;31(3):177-183.
6. Elenchezian TS, Senthilnathan S, Rajendran T, Kalirajan V, Jeyalakshmi P, Kiruthika N, *et al.* Performance of sugarcane cultivation in Thiuvannamalai District of Tamil Nadu, India - A socio-economic analysis. *Journal of Experimental Agriculture International*. 2024;46(1):68-76.
7. Ganesh Prasad TS, Shivalinge Gowda NS, Manjunatha BN. Economic performance of sugarcane growers in Cauvery, Tunga and Ghataprabha areas of Karnataka. *Mysore Journal of Agricultural Sciences*. 2011;45(4):873-878.
8. Singh K, Jahanara. A study on the knowledge and adoption of improved sugarcane production practices by the farmers in Sitapur District of U.P. *South Asian Journal of Agricultural Sciences*. 2024;4(2):29-32.
9. Lavanya Raj HP, Aski SG. Knowledge and adoption level of improved cultivation practices by sugarcane farmers in Belagavi and Bagalkot District of Karnataka. *Agricultural Update*. 2019;14(4):308-313.
10. Singh R, Sharma D. Adoption behavior of sugarcane growers in central Uttar Pradesh. *Journal of Community Mobilization and Sustainable Development*. 2022;17(1):110-116.
11. Kumar R, Meena NR, Doharey RK, Kumar A, Sandeep, Paia Biam K, *et al.* Factors determining adoption level of improved sugarcane production technology among farmers in Lakhimpur Kheri District, Uttar Pradesh. *Annals of Agricultural Research New Series*. 2025;46(2):211-217.
12. Jadhav SS, Sonawane HP, Tayade BD. Relationship of selected characteristics of sugarcane growers with knowledge and adoption of soil health management practices. *International Journal of Agriculture Extension and Social Development*. 2025;8(12):426-431.