Profile of Sugarcane Growers of Southern Karnataka and their Association with Crisis Management Behaviour

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ABSTRACT

The study was conducted during October, November month of 2022 and January month of 2023 in Mandya and Mysore districts, Karnataka state, India to study the profile of sugarcane growers and to find out the association between the profile of the sugarcane growers and their crisis management behaviour in Southern Karnataka. Mandya and Mysore districts of Karnataka were purposively selected and talukas, villages and respondents were selected through multistage simple random sampling. Two talukas each from Mandya and Mysore districts along with two villages from each taluka were selected randomly. From each village, 15 sugarcane growers with a minimum of five years of experience in sugarcane cultivation were selected randomly which made a sample size of 120 respondents. Data were collected using a structured interview schedule through the physical interview method. Statistical tools such as mean, frequency, percentage, SD, correlation and stepwise regression were used for data analysis. The findings revealed that sugarcane growers belonged to the category of middle-aged farmers with small landholdings with moderate income and possessed 10-20 years of farming experience. They generally had low or no formal education but exhibited a medium level of information-seeking behaviour, innovativeness, self-confidence, scientific orientation and credit support. They demonstrated high levels of cosmopoliteness, farming commitment and deferred gratification but had a moderate perception of crisis with a favourable attitude. Age, farming experience, income, information seeking behaviour, innovativeness, scientific orientation, farming commitment, deferred gratification and attitude towards crisis were the variables found to have a positive and significant association with the crisis management behaviour of farmers. Cosmopoliteness, annual income, farming experience, scientific orientation and attitude explained 40.00% of the variance in crisis management behaviour.

KEYWORDS: Crisis, crisis management behaviour, sugarcane, correlation, stepwise regression

Data Availability Statement: Legal restrictions are imposed on the public sharing of raw data. However, authors have full right to transfer or share the data in raw form upon request subject to either meeting the conditions of the original consents and the original research study. Further, access of data needs to meet whether the user complies with the ethical and legal obligations as data controllers to allow for secondary use of the data outside of the original study.

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1. INTRODUCTION

India's agro-climatic conditions are highly favourable for sugarcane cultivation, and it is grown across all states on about 5.0 million hectares, except in hilly and desert terrains and supporting over 7 million farmers along with workers of more than 550 sugar mills, thereby supporting the food and bioenergy sector (Viswanathan, 2022, Solomon, 2022). Today the sugarcane cultivation and the sugar industry stand as supporting pillars of the Indian agricultural economy. Sugarcane and sugar industry act as a major source of employment and livelihood in India. More than 50 million farmers are engaged in sugarcane cultivation and processing industries. Obtaining maximum yield from sugarcane crops improves the economic condition of these farmers (Powar et al., 2020)

Karnataka ranks third in terms of area (6.26 lakh ha) and production (53.20 million tonnes) and second in productivity (92 tonnes/ha). Mandya and Mysore districts are the leading sugarcane producing districts in southern Karnataka (Anonymous, 2023). The sugarcane productivity of Karnataka has declined from 105-110 t ha^{-1} (2006-07) to 90-95 t ha^{-1} due to the continuous monocropping system, which deteriorates the soil fertility. (Chigadolli et al., 2021; Sadashivanagowda et al., 2021). Due to supply chain disruption and a decline in aggregate demand in the market, the average price received by farmers has also decreased for many crops, leading to risks and serious threats for both farmers and consumers, creating a crisis situation. (Muneer et al., 2023; Raj et al., 2022).

India ranks 14th globally in terms of susceptibility to crises and economic losses in India due to such crises and calamities accounted to approximately US\$ 13,789 million, the fourth highest in the world (David et al., 2019). The crisis erodes the progress made in livelihoods and national development, which took considerable time to achieve. Production and income uncertainty due to the crisis creates serious consequences for farmers' income and future production planning (Raval et al., 2023). Floods, cyclones, droughts, natural calamities and changing precipitation patterns are the major hazards caused by climate change. Floods are the most frequently occurring calamity in India, accounting for 52 percent of the total calamities, followed by cyclones (30%), landslides (10%), earthquakes (5%) and droughts (2%) (Das and Ansari 2021, Parida and Goel, 2020). The floods in 2019 caused around 4 lakh tonnes of sugarcane damage in Karnataka (Anonymous, 2019a). Crisis conditions significantly affect sugarcane farmers psychologically, financially and socially, leading to an increase in farmers suicide rates in sugarcane-growing areas such as Belagavi and Mandya districts, with these suicides occurring annually in Karnataka (Anonymous, 2019b, Chaithanya et al., 2024).

During the COVID-19 pandemic in 2020, conditions such as shortage of labour supply, disruption in global farm product supply chains, domestic disruption in the collection of farm produce; interstate transport blockages and the closure of many retail markets emerged. Farmers faced difficulties in mobilizing labour for various farm operations like harvesting, threshing, packing etc. (Mishra et al., 2021, Roubik et al., 2022, Dandekar and Ghai, 2020, Kumar and Anwer, 2020).

Crisis management involves the measures and methodologies used to recognize, control and limit the damage of a crisis and its ripple effects. (Deon, 2020). Crisis management also involves attempts to eliminate technological failures to avoid or manage crisis situations (Kumbhani et al., 2023). The adoption of highly sustainable crop-based cropping system, technological innovations, agrotechnology and crisis management practices will lead to increased production and profitability, thereby making farmers' livelihoods more comfortable and stable (Tavethiya et al., 2021, Chowhan, 2021).

It is important to understand the factors influencing crisis management behaviour to facilitate the development of strategies, policies and mitigation mechanisms to alleviate the impact of crises. Therefore, the current study was conducted to explore various socio-personal, socio-economic, socio-communicational and socio-psychological characteristics of sugarcane farmers and to determine the associations between these characteristics and crisis management behaviour.

2. MATERIALS AND METHODS

2.1. Research locale

This study was carried out during October, November months of 2022 and January month of 2023. Mandya and Mysore districts of Karnataka were purposively selected as study areas because they were the main sugarcane producing districts of Southern Karnataka. Mandya (12.5218° N, 76.8951° E) and Maddur (12.5867° N, 77.0453° E) talukas in Mandya district, Nanjanagud (12.1160° N, 76.6782° E) and Narasipura (12.2110° N, 76.9038° E) talukas in Mysore district were selected randomly for the study.

2.2. Sample size

Two villages from each taluka were selected randomly, making a total of eight villages. From each village, 15 farmers were selected randomly with a minimum of five years of experience in sugarcane cultivation, making a sample size of 120 respondents. Talukas, villages and respondents were selected through multistage simple random sampling.

2.3. Method of data collection

The ex-post facto research design was employed in this

study keeping the objectives in mind. The pre tested interview schedule which consisted of independent variables measured by various scales and the dependent variable "crisis management behaviour" scale developed by Chigadolli (2022) was used for data collection with suitable modifications. Primary data was collected through personal interviews, which included farm and home visits between October and November, 2022, as well as January and February 2023. Secondary data was collected from research papers and postgraduate theses related to sugarcane.

2.4. Data analysis (Statistical tools and software)

The collected data was tabulated in MS Excel and analyzed using SPSS software by applying various statistical tools such as mean, frequency, percentage, standard deviation, the equal interval method (arbitrary method), correlation and stepwise regression (Figure 1).
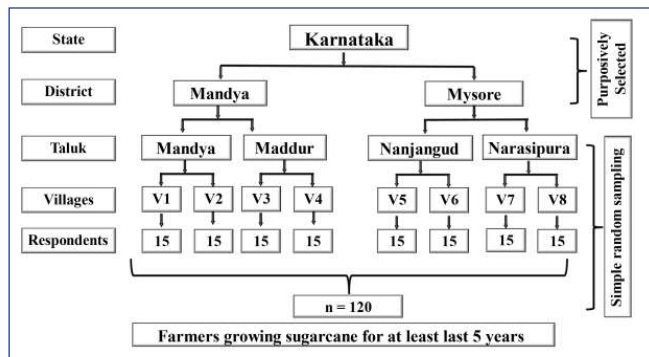

Figure 1: Sampling framework

3. RESULTS AND DISCUSSION

3.1.1. Age

Among sugarcane growers, 25.00 per cent were young (<35 years), 45.83 per cent were middle-aged (≥35 to <55 years) and 29.17 per cent were old (≥55 years) indicating a well-distributed age structure within the farming community. The age-wise distribution observed in the present study was in line with the findings of Vikash et al. (2024) and Chigadolli (2022), who also reported a balanced representation of different age groups among farmers (Table 1).

3.1.2. Farming experience

The distribution of sugarcane growers based on farming experience showed that 18.33% had low experience, 43.33% had medium experience and 38.33% had high experience indicating a substantial proportion of seasoned farmers in the industry. The distribution of farming experience observed in the present study aligned with the findings of Ansari et al. (2023) and Chigadolli (2022), who also reported a considerable presence of experienced farmers in their respective studies.

3.1.3 Formal education

The distribution of sugarcane growers based on formal education revealed that 29.16 per cent were illiterate, 13.34 per cent had received pre-primary education and 17.50 per cent had completed higher primary education. Additionally, 10.00 per cent had studied up to high school, 15.83 per cent had completed the 10th standard and 10.83 per cent had

Table 1: Profile of the sugarcane growers (n=120)

Independent variables	Category	Range	Frequency	Per cent	Mean	SD
Socio personal characteristics of sugarcane growers						
Age (X_1)	Young	<35 years	30	25.00	45.96	12.51
	Middle	≥35 to <55	55	45.83		
	Old	≥55 years	35	29.17		
Farming experience (X_2)	Low	<10 years	22	18.33	20.30	11.17
	Medium	10–20 years	52	43.33		
	High	>20 years	46	38.33		
Formal education (X_3)	Illiterate	0	35	29.16	3.15	1.88
	Pre-primary	1–4th std	16	13.34		
	Higher primary	5–7th std	21	17.50		
	High school	8–9th std	12	10.00		
	10th standard	10th std	19	15.83		
	PUC/ITI/Dipl	11–12th std	13	10.83		
	Graduation	10+2+3 or 4	4	3.34		
	PG/Ph.D.	10+2+3or4+3	0	0.00		

Table 1: Continue...

Independent variables	Category	Range	Frequency	Per cent	Mean	SD
Socio economic characteristics of sugarcane growers						
Land holding (X_4)	Marginal	<2.5 acres	44	36.67	2.86	1.14
	Small	2.51–5 acres	73	60.83		
	Medium	5.01–10 acres	3	2.50		
	Large	>10acres	0	0.00		
Annual income (X_5)	Low	Up to 2lakhs	64	53.33	2.38	1.19
	Medium	2.01–4 lakhs	50	41.67		
	High	>4.01 lakhs	6	5		
Credit support (X_6)	Low	<6	38	31.67	7.59	2.1
	Medium	≥6 to <11	49	40.83		
	High	≥11	33	27.50		
Socio communicational characteristics of sugarcane growers						
Information seeking behaviour (X_7)	Low	<12	33	27.50	15.95	4.82
	Medium	≥12 to <24	67	55.83		
	High	≥24	20	16.67		
Cosmopoliteness (X_8)	Low	<14	42	35.00	24.7	6.90
	Medium	≥14 to <22	20	16.67		
	High	≥22	58	48.33		
Socio psychological characteristics of sugarcane growers						
Innovativeness (X_9)	Low	<17	22	18.33	22.94	5.97
	Medium	≥17 to <27	58	48.33		
	High	≥27	40	33.33		
Scientific orientation (X_{10})	Low	<14	10	8.33	20.06	4.40
	Medium	≥14 to <22	61	50.83		
	High	≥22	49	40.83		
Farming commitment (X_{11})	Low	<20	35	29.16	31.89	7.61
	Medium	≥20 to <30	38	31.66		
	High	≥30	47	39.16		
Self Confidence (X_{12})	Low	<17	37	30.83	21.31	6.47
	Medium	≥17 to <27	55	45.83		
	High	≥27	28	23.33		
Deferred gratification (X_{13})	Low	<20	11	9.17	30.67	5.52
	Medium	≥20 to <30	46	38.33		
	High	≥30	63	52.50		
Perception towards crisis (X_{14})	Poor	<17	29	24.17	19.36	3.92
	Moderate	≥17 to <24	69	57.50		
	Good	≥24	22	18.33		
Attitude towards crisis (X_{15})	Unfavourable	<19	21	17.50	33.2	8.04
	Neutral	≥19 to <30	36	30.00		
	Favourable	≥30	63	52.50		

pursued PUC, ITI or a diploma. A smaller proportion, 3.34 per cent, had attained graduation, while none had pursued postgraduate or doctoral education. The distribution of formal education among sugarcane growers observed in the present study was somewhat in line with the findings of Vikash et al. (2024) and Chigadolli (2022), who also reported a predominance of lower educational attainment within the farming community.

3.1.4. Land holding

The distribution of sugarcane growers based on landholding size showed that 36.67% are marginal farmers (<2.5 acres), 60.83% were small farmers (2.51–5 acres) and only 2.50% owned medium-sized farms (5.01–10 acres). Notably, none of the growers fell into the large farm category (>10 acres), indicating a predominance of small and marginal landholders in sugarcane cultivation. The distribution of landholding among sugarcane growers in the present study was broadly consistent with the findings of Vikash et al. (2024) and Supriya (2013), who also observed a predominance of small and marginal farmers engaged in sugarcane cultivation.

3.1.5. Annual income

The distribution of sugarcane growers based on annual income showed that 53.33% earned up to ₹ 2 lakhs, 41.67% fell in the medium-income category (₹ 2.01–4 lakhs) and only 5% had a high annual income exceeding ₹ 4.01 lakhs. This indicated that the majority of growers had low to moderate earnings from sugarcane cultivation. The income distribution pattern among sugarcane growers in the present study aligned broadly with the observations of Chigadolli (2022) and Madhu (2019), both of whom reported that most farmers earned low to moderate annual incomes from sugarcane cultivation.

3.1.6. Credit support

The distribution of sugarcane growers based on credit support revealed that a significant proportion, 38.00% received low credit support, while 49.00% fell in the medium category. Meanwhile, 33.00% of growers received high credit support, indicating varying levels of financial assistance among farmers. This may be due to the study area being predominantly composed of illiterate farmers and the complex financing methods of formal credit institutions like banks leading many farmers to prefer moneylenders. They could easily obtain money from moneylenders without extensive paperwork by mortgaging their assets, often without realizing that they were paying high interest rates. This may have explained the medium and high level of credit support observed in the study. The findings were almost consistent with those of Chigadolli (2022), who also reported similar trends in credit support among farmers.

This suggests a recurring pattern of reliance on informal sources due to challenges in accessing formal credit.

3.1.7. Information seeking behaviour

The distribution of sugarcane growers based on information-seeking behavior showed that 27.50% exhibited low information-seeking behavior, 55.83% fell in the medium category and 16.67% displayed high information-seeking behavior. This suggested that a majority of growers actively sought information at moderate levels. The findings were in partial agreement with those reported by Ansari et al. (2023), indicating comparable trends in information-seeking behavior among farmers.

3.1.8. Cosmopoliteness

The sugarcane growers exhibited varying levels of cosmopoliteness, with 35.00% having low exposure, 16.67% falling in the medium category and 48.33% displaying high cosmopoliteness. This indicates that nearly half of the growers actively engaged with external environments and sources of information and it may have been due to the frequent organization of Krishi Melas, farm exhibitions, training programs and field exposure visits by KVKs in the study area. These activities provided continuous exposure, encouraging farmers to travel, interact with other farmers and experts and exchange knowledge. The findings were in line with those reported by Madhu (2019), who also observed that farmers with greater exposure to agricultural events and interactions tended to exhibit higher levels of cosmopoliteness.

3.1.9. Innovativeness

The sugarcane growers exhibited varying levels of innovativeness, with 18.33% having low innovativeness, 48.33% falling in the medium category and 33.33% displaying high innovativeness. This indicates that a significant proportion of growers were inclined toward adopting new practices. The findings aligned with those of Ansari et al. (2023) and Chigadolli (2022), who also reported that a considerable proportion of farmers demonstrated a willingness to experiment with and adopt innovative agricultural practices.

3.1.10. Scientific orientation

The sugarcane growers exhibited varying levels of scientific orientation, with 8.33% having low scientific orientation, 50.83% falling in the medium category and 40.83% displaying high scientific orientation. The regular engagement of farmers with Krishi Melas, training programs and farm exhibitions also familiarized them with updated technologies and modern agricultural practices. This exposure may have contributed to the medium to high level of scientific orientation observed in the study. The findings were in line with those reported by Vikash et al. (2024),

Ansari et al. (2023) and Kaushik et al. (2018), who also observed moderate to high levels of scientific orientation among farmers.

3.1.11. Farming commitment

The sugarcane growers exhibited varying levels of farming commitment, with 29.16% having low commitment, 31.66% falling in the medium category and 39.16% displaying high commitment. This indicated that a substantial number of farmers were highly dedicated to their farming activities. It may have been due to deep-rooted connections to land and a family tradition of the farmers having medium to high farming commitment.

3.1.12. Self confidence

The sugarcane growers exhibited varying levels of self-confidence, with 30.83% having low self-confidence, 45.83% falling in the medium category and 23.33% displaying high self-confidence. This suggests that most growers possessed a moderate level of confidence in their farming abilities. The findings were somewhat similar to the observations made by Subhrajyoti (2017), who reported that a majority of farmers exhibited a moderate level of self-confidence.

3.1.13. Deferred gratification

The sugarcane growers exhibited varying levels of deferred gratification, with 9.17% having low deferred gratification, 38.33% falling in the medium category and 52.50% displaying high deferred gratification. This indicated that a majority of growers prioritized long-term gains over immediate benefits. Since the study area was prone to crisis and had faced crisis multiple times in the past, the number of times which led farmers to develop an understanding that postponement of immediate rewards could lead to long lasting rewards in the future which caused the majority of farmers to have high deferred gratification. The findings were somewhat in line with those reported by Chigadolli (2022) and Somashekara (2010), who also observed a higher tendency of deferred gratification among farmers exposed to recurrent agrarian crises.

3.1.14. Perception towards crisis

The sugarcane growers exhibited varying levels of perception towards crisis, with 24.17% having a poor perception, 57.50% falling in the moderate category and 18.33% displaying a good perception. This suggested that most farmers recognized challenges but may have required better coping strategies. The findings were somewhat in agreement with those of Chigadolli (2022), who also reported a predominance of moderate perception levels among farmers towards crisis situations.

3.1.15. Attitude towards crisis

The sugarcane growers exhibited varying attitudes towards crises, with 17.50% having an unfavourable attitude (<19), 30.00% falling in the neutral category (≥19 to <30) and 52.50% displaying a favourable attitude (≥30). This indicated that more than half of the growers demonstrated resilience. It may have been due to their past experience and frequent occurrence of crisis like floods, price and production crisis which led them to develop favourable attitude towards such crisis situations. The findings were somewhat similar to those reported by Chigadolli (2022), who also found that farmers tended to develop favourable attitudes due to repeated exposure to crisis situations (Table 2).

Table 2: Crisis management behaviour of sugarcane growers towards crisis

	Category	Range	Frequency	Per cent	Mean	SD
Crisis management behaviour	Low	<143	42	35.00	188.6	13.66
	Moderate	≥143 to <225	50	41.67		
	High	≥ 225	28	23.33		

The majority (41.67%) fell under the moderate category, indicating that most growers exhibited a balanced approach to crisis management. Meanwhile, 35.00% had low crisis management behaviour, suggesting limited preparedness or response strategies and 23.33% showed high crisis management behaviour, demonstrating strong resilience and adaptability in crises. These findings align with Vinaya Kumar (2015), who reported a similar distribution of crisis management level among farmers and Chigadolli (2022), who noted that moderate crisis management behaviour was most prevalent among sugarcane growers (Table 3).

3.2.1. Socio-personal characteristics association with crisis management behaviour

The age and the farming experience of the sugarcane growers were positively and significantly associated with their crisis management behaviour at the 5% and 1 per cent levels of significance respectively. This may have been due to the fact that as sugarcane growers aged, they were exposed to various crisis situations and gaining more experience automatically improved their crisis management behaviour and the farming experience encouraged new learning enabled growers to accept new challenges posed by crises and helped them to develop effective mitigation mechanisms and adaptations, ultimately resulting in improved crisis management behaviour. Formal education is non-significantly associated with crisis management behaviour. The positive association of farming experience with crisis management behaviour is supported by Vinaya Kumar and Shivamurthy (2021), Kumbhani et al. (2023) and Chigadolli (2022), who reported that experienced farmers showed better adaptability and coping mechanisms

Table 3: Association between independent variables with crisis management behaviour

Characteristics	Sl. No.	Independent variables	Correlation value
Socio-personal	1.	Age (X_1)	0.219*
	2.	Farming experience (X_2)	0.248**
	3.	Formal education (X_3)	0.146[NS]
Socio-economic	4.	Land holding (X_4)	-0.156[NS]
	5.	Annual income (X_5)	0.359**
	6.	Credit support (X_6)	-0.068[NS]
Socio-communicational	7.	Information seeking behaviour (X_7)	0.273**
	8.	Cosmopoliteness (X_8)	0.183[NS]
Socio-psychological	9.	Innovativeness (X_9)	0.233*
	10.	Scientific orientation (X_{10})	0.244**
	11.	Farming commitment (X_{11})	0.276*
	12.	Self confidence (X_{12})	0.083[NS]
	13.	Deferred gratification (X_{13})	0.194*
	14.	Perception towards crisis (X_{14})	0.101[NS]
	15.	Attitude towards crisis (X_{15})	0.304**

*p<0.05, **p<0.01, NS: Non-significant

during crises for effective crisis management. Similarly, Ninama et al. (2023) found that older farmers, due to their prolonged exposure to various crisis situations, demonstrated more effective and strategic crisis management behaviour (Figure 2).

3.2.2. Socio-economic characteristics association with crisis management behaviour

The annual income of sugarcane growers was positively and significantly associated with the crisis management behaviour at the 1% level of significance this may have been due to the fact that as the income of a sugarcane grower increased, they were more willing to take risks by investing the money in crisis management which demonstrated a higher level of crisis management behaviour. Land holding and credit support were non significantly associated with the crisis management behaviour. The positive association between annual income and crisis management behaviour is supported by Kumbhani et al. (2023), who reported that
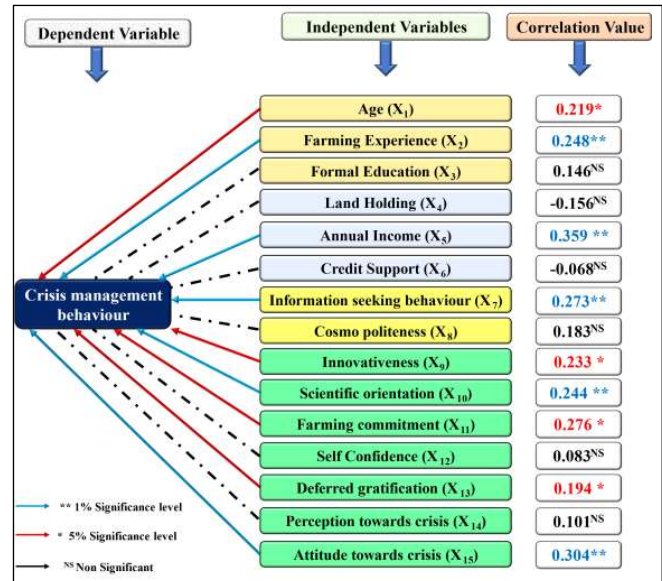

Figure 2: Association between independent variables with crisis management behaviour

higher-income farmers were more capable of investing in preventive and adaptive measures for crisis management. Similarly, Ninama et al. (2023) observed that financially stable farmers exhibited stronger crisis management behaviour due to better access to resources and support systems.

3.2.3. Socio-communicational characteristics association with crisis management behaviour

The information seeking behaviour was positively and significantly associated with the crisis management behaviour at the 1% level of significance. Information-seeking behaviour helped reduce uncertainty, enhanced situational awareness, supported proactive decision-making and improved adaptability, all of which were crucial for effective crisis management. However, cosmopoliteness was non-significantly associated with the crisis management behaviour. The positive association between information-seeking behaviour and crisis management behaviour is supported by Manjuprakash et al. (2024), who found that farmers actively seeking information were better equipped to manage crisis and make timely decisions during crises. Similarly, Kumbhani et al. (2023) reported that farmers with frequent access to agricultural information sources demonstrated improved responsiveness and confidence in managing crisis situations.

3.2.4. Socio-psychological characteristics association with crisis management behaviour

The scientific orientation and attitude towards crisis were positively and significantly associated with the crisis management behaviour at the 1% level of significance. This may have been because growers with higher scientific orientation were more likely to adopt a new idea, latest

technologies and employing scientific methods for crisis management. Attitude towards crisis shaped crisis management behaviour by influencing preparedness, decision-making, adaptability and response effectiveness. Farming commitment, innovativeness and deferred gratification were significantly associated with the crisis management behaviour at the 5% level of significance. This may have been due to the fact that farmers who were dedicated to farming and have a strong desire to stay in agriculture and manage crisis, in a way that shows a higher crisis management behaviour. Innovativeness enhanced crisis management behaviour by fostering adaptive problem-solving, quick decision-making and creative solutions in crisis situations. Farmers increased their savings as well as capital accumulation and used them during the crisis periods, which reflected higher crisis management behaviour. Self-confidence and perception towards crisis were non-significantly associated with the crisis management behaviour. The positive association of scientific orientation with crisis management behaviour is supported

by Vinaya Kumar and Shivamurthy (2021), Ninama et al. (2023), Kumbhani et al. (2023) and Chigadolli (2022), who found that scientifically oriented farmers were more likely to adopt innovative practices and technologies during crises. A similar positive link was reported for attitude towards crisis by Chigadolli (2022), indicating that a proactive mindset enhanced crisis preparedness and response. The significant role of farming commitment in crisis management is in line with the findings of Vinaya Kumar and Shivamurthy (2021), Ninama et al. (2023) and Chigadolli (2022), who noted that committed farmers demonstrated stronger determination to overcome crisis challenges. Innovativeness was also found to be a key factor in enhancing crisis behaviour by Kumbhani et al. (2023) and Chigadolli (2022), as it enabled quicker and more adaptive responses for crisis. The positive effect of deferred gratification is supported by Vinaya Kumar and Shivamurthy (2021), Ninama et al. (2023) and Chigadolli (2022), who highlighted that farmers who practiced long-term planning and saving were better prepared to manage crisis situations (Table 4).

Table 4: Stepwise regression analysis

Model	Predictors variables	R	R Square	Adjusted R square	Std. Error
1	Cosmopoliteness (X_8)	0.437[a]	0.191	0.184	10.84
2	Cosmopoliteness (X_8), Annual income(X_5)	0.539[b]	0.291	0.279	10.19
3	Cosmopoliteness (X_8), Annual income (X_5), Farming experience (X_2)	0.582[c]	0.338	0.321	9.88
4	Cosmopoliteness (X_8), Annual income (X_5), Farming experience (X_2), Scientific orientation (X_{10})	0.621[d]	0.386	0.364	9.57
5	Cosmopoliteness (X_8), Annual income (X_5) Farming experience (X_2), Scientific orientation (X_{10}), Attitude towards crisis (X_{15})	0.652[e]	0.425	0.400	9.30

Cosmopoliteness (X_8) alone explained 19.1% of the variation in the dependent variable (Crisis management behaviour), with an R value of 0.437 and a standard error of 10.839. The cosmopoliteness was selected first as it played a crucial role in shaping a farmer's exposure to new knowledge, farming practices and external interactions. Though its correlation with the crisis management behaviour was non-significant (0.183[NS]), its inclusion in the regression model suggested that it had an indirect or interaction effect with other variables. Adding annual income (X_5) increased the explanatory power to 29.1% (R^2=0.291), improving the model's accuracy with an R value of 0.539 and a reduced standard error of 10.194. The annual income was significantly correlated (0.359) and enhanced the model. The farmers with higher income were able to invest in better technology, resources and improved farming methods, strengthening the relationship between income and performance. The inclusion of farming experience (X_2) further strengthened the model, raising R^2 to 0.338 and lowering the standard

error to 9.888, with an R value of 0.582. Farming experience had a significant correlation (0.248) and was included in the model. Experienced farmers had better decision-making abilities, risk management strategies and adaptability to new farming techniques, making it an important factor. Scientific Orientation (X_{10}) was introduced, increasing R^2 to 0.386 and further refining the model's predictive power, with an R value of 0.621 and a standard error of 9.568. The scientific orientation was also significantly correlated (0.244) and contributed to better farming efficiency, as farmers with a scientific outlook adopted modern technologies, fertilizers and scientific methods in agriculture. The final model, incorporating attitude towards crisis (X_{15}), achieved the highest explanatory power (R^2=0.425), with an R value of 0.652 and the lowest standard error of 9.298, indicating the strongest model fit. The attitude towards crisis had a significant correlation (0.304) and was included in the final model. The farmers with a favorable attitude toward crises were more resilient, adaptable and capable of managing risks

efficiently, which impacted their agricultural performance.

The final model with all predictor variables (Cosmopoliteness, Annual income, Farming experience, Scientific Orientation, Attitude towards Crisis) explained 40.00% of the variance in crisis management behaviour. These results align with the findings of Vinaya Kumar and Shivamurthy (2021), who highlighted the importance of income, experience, scientific orientation and cosmopoliteness in crisis preparedness and Chigadolli (2022), who emphasized the role of a positive attitude towards crisis in enhancing resilience and adaptability. This underlines the need to strengthen these key behavioural and socio-economic traits through focused training, information dissemination and supportive policies to improve farmers' crisis management behaviour.

4. CONCLUSION

Most farmers were middle-aged, smallholders with moderate farming experience, low income, limited education and favourable attitudes towards crisis. They showed high cosmopoliteness, deferred gratification, and farming commitment, along with moderate levels of information-seeking, innovativeness, self-confidence, scientific orientation and credit support. Age, farming experience, income, information-seeking, innovativeness, scientific orientation, farming commitment, deferred gratification and attitude were positively and significantly associated with crisis management behaviour. Cosmopoliteness, income, experience, scientific orientation and attitude explained 40.00% of variance in crisis management behaviour.

5. ACKNOWLEDGEMENT

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