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Path analysis showing the effects of the profile of the sugarcane growers with their Crisis Management behaviour

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Abstract

In India sugarcane is the 2nd major commercial crop grown after cotton and is the 2nd largest raw material provider for agro-based industry after textile. Sugarcane farmers are facing various crisis conditions which significantly affect sugarcane farmers psychologically, financially, and socially, impacting their coping capacities. It is important to understand the factors influencing the crisis management behaviour of sugarcane. So, a study was conducted to find out the Path analysis showing the effects of the profile of the sugarcane growers and their crisis management behaviour in Southern Karnataka. Mysore and Mandya districts were selected purposively because of leading producers in southern Karnataka. Talukas villages and respondents are selected through multistage simple random sampling. Two talukas of Mandya district and two talukas of Mysore district were selected randomly and two villages from each taluka constituting eight villages and from each village 15 sugarcane growers with minimum five years of experience in sugarcane cultivation were selected randomly constituting a sample size of 120 respondents. Data was collected with structured interview schedule through physical interview method. Path analysis was used as statistical tool for data analysis. The findings revealed that cosmopoliteness, innovativeness and age of the sugarcane growers were the key variables in exerting considerable direct, indirect and substantial effect on the crisis management behaviour of the sugarcane growers. Annual income, cosmopoliteness and attitude towards crisis are having significant relationship at 1% significance level, whereas scientific orientation is 5% significance level with the direct effect on the crisis management behaviour of sugarcane growers.

Keywords: Crisis management behaviour, Direct effect, Indirect effect, Substantial effect

Introduction

Sugarcane occupies an important position in agrarian economy of India. India is the only country in the world where sugarcane is cultivated in both tropical and sub-tropical climate. India is the second largest producer of sugarcane in the world and Karnataka is the third largest producing state of India. Sugarcane crop and its products contributes 1.1 per cent to GDP significantly considering crop grown only in 2.57 per cent of gross cropped area (Arun *et.al* 2022) [3]. The sugar industry directly employs over 500,000 workers and indirectly supports a wide range of industries that utilize the by-products of the sugar sector as raw materials such as bagasse, molasses, alcohol, press mud, boiler ash, and protein.

Crisis as an uncertain situation possessing latent risks and opportunities that must be resolved within a given time frame (Deon Canyon, 2020) [4]. Agriculture mainly depends on agro-climatic conditions and prone to various types of crises, climate change and many of the crisis are beyond human control. Though their occurrence can't be controlled but their effect can be minimised with proper crisis management techniques. It erodes the progress made in livelihoods and national development, which took considerable time to achieve. The disruption caused by crises exposes the livelihoods of farmers and introduces additional risks, resulting in stress and adverse circumstances.

Karnataka has tremendous potential for increasing the cane cultivation and achieving higher yields, as the soil and agro-climatic conditions are most suitable for planting the cane in different seasons, giving scope for establishment of more sugar units in the state. The Kaveri River basin area in Karnataka, where majority of the farmers livelihoods are tangled with farming pursuits which impose challenges to

sugarcane farming with equal opportunities. It would seriously threaten to push sugarcane growers to face more unpredictable and uncertain situations like floods and droughts, unpredicted rainfall pattern, pest and disease outbreak are affecting sugarcane cultivators seriously. Sugarcane farmers face various crisis in the cultivation, and these crises have consequences that extend beyond immediate and short-term impacts. The varying degrees of crisis conditions were affecting sugarcane farming community psychologically, financially, socially and their coping capacities. As a testimony to these crises, farmers suicides were more in the sugarcane growing areas like Belagavi and Mandya (Anonymous, 2019) [1]. It is important to understand the factors influencing the crisis management behaviour of sugarcane growers during crisis.

Crisis management behaviour is defined as the individual sugarcane growers' ability to manage/overcome/resolve the crisis in sugarcane farming, which is assessed by the decision-making ability, adaptability and economic performance of sugarcane growers. (Mutteppa 2022) [5]. The study of crisis management behaviour helps in improving crisis preparedness, mitigation, response and recovery through formulation of suitable and location-specific strategies and policies by the concerned departments and other stakeholders (Anonymous, 2021) [2]. Therefore, understanding the factors influencing the crisis management behaviour of sugarcane growers during crisis occurrences is essential to alleviate the impact of these crises.

Objectives

To study the path analysis showing the effects of the profile of sugarcane growers with their crisis management behaviour

Methodology

Mandya and Mysore districts of Karnataka was selected purposively as study area because two districts were the main sugarcane producing districts of Southern Karnataka. Mandya and Maddur talukas in Mandya district, Nanjanagud and Narasipura talukas in Mysore district were selected randomly for the study. Two villages from each taluka were selected randomly making a total of eight villages. From each village 15 sugarcane farmers were selected randomly with minimum five years of experience in sugarcane cultivation making a sample size of 120 respondents. Talukas, villages and respondents are selected through multistage simple random sampling. Ex-post facto research design was employed in the present investigation by keeping the objectives in the mind in which the independent variables are not directly manipulated, either because they have already occurred or are not inherently manipulated. The pre tested interview schedule was used for data collection with suitable modification. Primary data was collected through personal interviews, which included farms and home visits. These interviews were carried out 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. The collected data was tabulated in MS Excel and analysed using OPSTAT by applying path analysis statistical tool.

Results

The coefficient of correlation of the data shows the relationship between independent and dependent variables in presence of all other variables, which are normally operative in a real-life situation. The relationship exhibited by correlation study may change on different situations, where some of the independent variables may not exist in the environment or they may be concealed. To know the influence of independent variables both directly, as well as, through other variables, the correlation coefficient values indicated earlier were attempted for path analysis.

Table 1: Path analysis showing the effects of the profile of Sugarcane growers and their Crisis Management Behaviour (n=120)

	Variables	Total Direct effect	Total indirect effect	Substantial indirect effect
X_1	Age	-0.088	0.333	0.256 (X_2)
X_2	Farming experience	0.290	-0.062	0.023 (X_4)
X_3	Formal Education	0.074	0.071	0.078 (X_{10})
X_4	Land Holding	-0.144	0.094	0.102 (X_5)
X_5	Annual income	0.312**	0.062	0.049 (X_8)
X_6	Credit Support	-0.022	-0.120	0.012 (X_1)
X_7	Information seeking Behaviour	-0.121	0.305	0.144 (X_8)
X_8	Cosmopoliteness	0.344**	0.080	0.045 (X_5)
X_9	Innovativeness	-0.016	0.365	0.114 (X_5)
X_{10}	Scientific Orientation	0.200*	0.101	0.055 (X_5)
X_{11}	Farming Commitment	0.047	0.175	0.059 (X_2)
X_{12}	Self Confidence	0.090	0.126	0.044 (X_5)
X_{13}	Deferred Gratification	0.009	0.228	0.070 (X_5)
X_{14}	Perception towards crisis	0.032	0.121	0.024 (X_{12})
X_{15}	Attitude towards crisis	0.198**	0.102	0.064 (X_5)

*5% significance level ** 1% significance level

All the fifteen variables were subjected to path analysis. The data thus, indicate that the partial relationship between the variables. Partially relationship was a contribution made by other variables exercising their influence jointly. It is, therefore, necessary to study the influence of one variable on another variable both directly as well as through other variables presented in the situation. The result of path analysis is presented in Table 1.

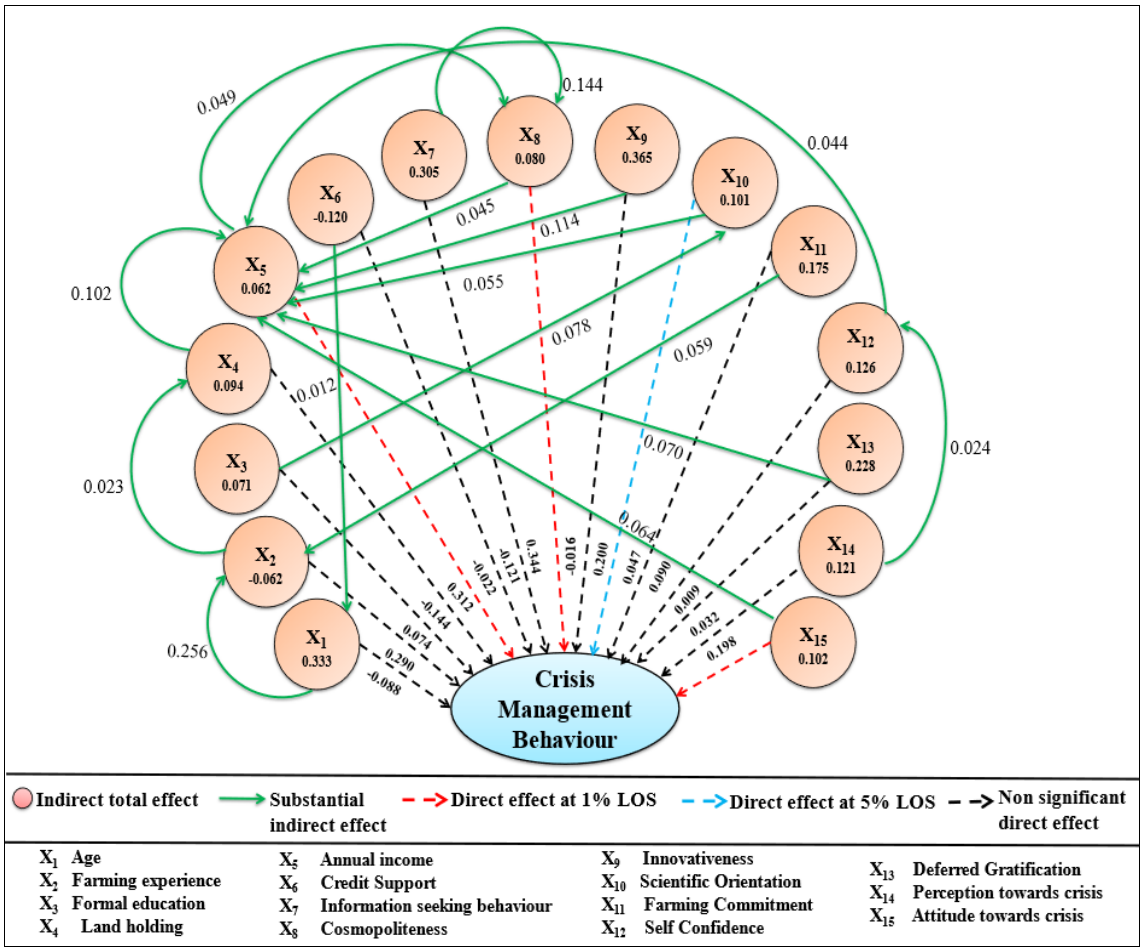

Fig 1: Direct & indirect effect of independent variables with their Crisis Management behaviour

Direct effect

The data in Table 1 and fig.1 revealed that cosmopoliteness had exerted maximum direct positive effect (0.344) followed by annual income (0.312), farming experience (0.290), scientific orientation (0.200), attitude towards crisis (0.198), self-confidence (0.099), farming commitment (0.047), formal education (0.074), perception towards crisis (0.032) and deferred gratification (0.009). As far as negative direct effect is concerned land holding (-0.144) has exerted maximum negative effect, followed by information seeking behaviour (-0.114), age (-0.088), credit support (-0.022), innovativeness (-0.016).

It can be inferred that major variables contributing the maximum direct positive effect on crisis management behaviour are cosmopoliteness, annual income, farming experience, scientific orientation, attitude towards crisis, self-confidence, farming commitment, formal education, perception towards crisis, deferred gratification in descending order, while land holding, information seeking behaviour, age, credit support, innovativeness contributing negative direct effect in descending order on the crisis management behaviour.

Out of the 15 variables only 4 variables were significant in their direct effect with crisis management behaviour. Annual income, cosmopoliteness and attitude towards crisis are having significant relationship at 1% significance level, whereas scientific orientation is 5% significance level with the direct effect on the crisis management behaviour of sugarcane growers.

Total indirect effect

So far, the total indirect effect is concerned, thirteen variables had a positive total indirect effect and two had a negative indirect effect on the crisis management behaviour. Further, it can be observed that innovativeness (0.365) has maximum indirect effect followed by age (0.333), information seeking behaviour (0.305), deferred gratification (0.228), farming commitment (0.175), self-confidence (0.126), perception towards crisis (0.121), attitude towards crisis (0.102), scientific orientation (0.101), land holding (0.094), cosmopoliteness (0.080), formal education (0.071) and annual income (0.062) on the crisis management behaviour. Whereas, Farming experience (-0.062) and credit support (-0.120) had a negative total indirect effect on the crisis management behaviour.

Substantial indirect effect

Data further revealed that out of 15 substantial indirect effects, seven each routed through annual income, two routed through farming experience, two routed through cosmopoliteness, and one routed through age, land holding, self-confidence and scientific orientation on crisis management behaviour.

First substantial positive indirect effect on crisis management behaviour was put forth by age (0.256) of sugarcane farmers through farming experience, followed by information seeking behaviour (0.144) through cosmopoliteness, innovativeness (0.114) through annual income, land holding (0.102) through annual income, formal

education (0.078) through scientific orientation, deferred gratification (0.070) through annual income, attitude towards crisis (0.064) through annual income, farming commitment (0.059) through farming experience, scientific orientation (0.055) through annual income, annual income (0.049) through cosmopoliteness, cosmopoliteness (0.045) through annual income, self-confidence (0.044) through annual income, perception towards crisis (0.024) through self-confidence, farming experience (0.023) through land holding and finally credit support (0.012) through age.

Conclusion

It could be concluded that cosmopolites, innovativeness and age of the sugarcane growers were the key variables in exerting considerable direct, indirect and substantial effect on the crisis management behaviour of the sugarcane growers. Annual income, cosmopoliteness and attitude towards crisis are having significant relationship at 1% significance level, whereas scientific orientation is 5% significance level with the direct effect on the crisis management behaviour of sugarcane growers.

Conflict of Interest

There is no conflict of interest among any authors regarding publication of the research paper in the journal as well as in the content

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