Decoding Agripreneurship Intentions: The Role of Behavioral Control Theory Over Time

Gabriel Wei En Wee[1*] and Irving Shou Hui Ting[2]

[1,2] *Faculty of Business, Design and Arts, Swinburne University of Technology Sarawak, Kuching, Malaysia*

[1]*gwewee@swinburne.edu.my;* [2]*ithui@swinburne.edu.my*

*Corresponding Author

ABSTRACT

This longitudinal study investigates the influence of covert and overt behavioural controls on entrepreneurial intentions in the agricultural sector, drawing on Behavioural Control Theory. The research sample predominantly consisted of males with diverse age ranges and educational backgrounds, primarily employed in non-agricultural sectors. Descriptive statistics, collinearity diagnostics, and structural equation modeling (SEM) were used to analyze the data. The results indicate that covert behavioural control has a consistently significant positive impact on entrepreneurial intentions, while overt behavioural control has a marginally significant effect. High levels of reliability and validity for the constructs were maintained over time. The study's theoretical contributions emphasize the importance of intrinsic motivation and internalized forms of control in entrepreneurial behavior, challenging existing assumptions about the role of overt control. Practically, the findings suggest that educational programs, financial support mechanisms, and policy frameworks should focus on enhancing intrinsic motivations and providing comprehensive support systems for aspiring agricultural entrepreneurs.

Keywords: *Agripreneurship, entrepreneurial intentions, behavioural control theory*

INTRODUCTION

Agricultural entrepreneurship, also known as agripreneurship, focuses on establishing innovative and sustainable businesses within the agriculture sector (Dollinger, 2008). Agripreneurs play a vital role in eradicating poverty in local communities by creating job opportunities, increasing productivity, and improving the quality of life. Agripreneurship has immense potential to alleviate poverty, especially in rural areas where agriculture is a primary source of income (Barnett & Mahul, 2007). Agripreneurs can achieve this by generating employment in farming (Alsos et al., 2003), food production (Ouko et al., 2022), and by introducing new technologies and practices to enhance agricultural productivity (Muzari et al., 2012). Additionally, they connect farmers with local and global markets (Jia et al., 2014), and improve food security by increasing the availability and accessibility of nutritious food in local communities (Ziso et al., 2022). Consequently, agripreneurship can significantly contribute to building a more resilient and prosperous future for all.

The decision to pursue agripreneurship is influenced by several key factors. Increasing interest in sustainable agriculture motivates individuals to contribute to environmentally friendly practices, organic farming, and biodiversity conservation. Concerns about food security and the desire for self-sufficiency drive individuals to engage in agripreneurship to produce their own food or contribute to local food production. Additionally, the integration of technology and innovation in agriculture presents new opportunities for agripreneurs to enhance productivity and profitability. Economic prospects, the appeal of a nature-oriented lifestyle, and supportive policies and programs also attract individuals to venture into agripreneurship. Understanding these factors allows stakeholders to create an environment conducive to agripreneurship, fostering sustainable agriculture, rural development, and economic growth.

This study aims to explore how agripreneurial intentions and the influencing factors of the Theory of Behavioral Control (TBC) evolve over time. By examining these factors longitudinally, the research seeks to provide insights into the sustainability and long-term impact of behavioral control on entrepreneurial intentions. This understanding is crucial for designing targeted interventions and support systems to nurture and sustain agripreneurial ventures.

LITERATURE REVIEW

Agripreneurship is a branch of entrepreneurship focused on creating innovative and sustainable solutions for the agricultural sector (Rao & Kumar, 2016). It involves identifying problems and challenges faced by farmers, developing new products or services, and bringing them to market. Agriculture entrepreneurship is a critical component of sustainable agriculture (Guidi, 2011), as it helps improve productivity, reduce waste, and increase profitability.

Farmers must participate in entrepreneurial activities to navigate the complex and multifaceted environment in which they operate (McElwee, 2006). This sector is currently experiencing rapid changes and new challenges on both the demand and supply sides (Gellynck et al., 2014). Agricultural enterprises have had to adapt to difficulties such as market shifts, changes in consumer preferences, food safety, sustainability, and biotechnology (Lans et al., 2020). Scholars' interest in agricultural entrepreneurship has grown due to farmers' adaptive behaviors in response to current environmental, social, and economic crises (Chen et al., 2014; Shaffril et al., 2018).

Despite the challenges faced by agripreneurs, there are significant opportunities in the agriculture sector. There is a growing demand for sustainably produced (Henchion et al., 2021) and locally sourced food (Basha & Lal, 2019), presenting opportunities for new business models and supply chains. Additionally, the need for new technologies and innovations, such as precision agriculture, robotics, and biotechnology, is critical for improving productivity and efficiency in the sector (Kapoor & Sharma, 2022).

The agriculture sector is highly capital-intensive, requiring significant investment in land (Sheehan et al., 2018), equipment (Chiwaula et al., 2018), and other resources. Technological advancements have made agriculture more capital-intensive, favoring large farmers who can afford sophisticated machinery, chemical fertilizers, insecticides/pesticides, and other inputs (Singh et al., 2008). The deployment of modern agricultural technology has led to increased agricultural production and productivity. The Green Revolution has significantly impacted agriculture through

improved seed quality, fertilizers, insecticides, and irrigation systems (Kumar, 2019).

Recently, agripreneurship empowerment programs have emerged as a typical technique for promoting youth agripreneurship, helping young people develop appropriate skills and improve the performance of youth-led agribusiness firms (Adeyanju et al., 2021). Many studies have identified these courses as motivators for young people to embrace innovations aimed at tackling specific agricultural issues (Ray et al., 2022). These programs have shown potential in harnessing agripreneurship and boosting young farmers' agripreneurial abilities (Adeyanju et al., 2021). With persistent economic and environmental challenges, there is an increased urgency to diversify farmers' skills beyond primary food production to expand their economic options and enhance their livelihoods (Mulema et al., 2021).

Ajzen (1991) defines intention as a person's preparedness for engaging in a certain behavior. In the context of entrepreneurship, Thompson (2009) defines intention as a self-acknowledged conviction by an individual that they intend to set up a new business venture and consciously plan to do so in the future. The Theory of Behavioral Control sheds light on the variables affecting people's decisions to launch and run agricultural businesses in agripreneurship. It focuses on how individuals believe they can effectively engage in agripreneurship and overcome associated challenges.

The Theory of Behavioral Control (TBC) emerged as an expansion of the Theory of Planned Behaviour (TPB) developed by Ajzen (1991). TPB is a well-established theory in social psychology and behavioral science that clarifies and predicts human behavior across various disciplines. The core premise of TPB is that intentions, influenced by three primary variables—attitudes, subjective norms, and perceived behavioral control—determine a person's behavior. Positive attitudes increase the likelihood of engagement, while negative attitudes decrease it. Attitudes encompass an individual's assessment and feelings related to a behavior. Subjective norms represent social pressure and other people's expectations, influencing intentions based on perceived reception. When individuals feel more in control of their behavior, their intentions are stronger, and they are more likely to engage in that behavior. Perceived behavioral control is related to a person's confidence in their capacity to perform a behavior successfully.

The Theory of Behavioral Control (Lim & Weissmann, 2021), an improved version of TPB, places even greater emphasis on perceived behavioral control. It acknowledges that people's perceptions about their ability to regulate a behavior significantly influence their intentions and subsequent actions. The precise elements that impact perceived behavioral control, such as self-efficacy, resources, abilities, and situational restrictions, are better understood through this expanded perspective. The theory offers a more comprehensive view of how perceptions of control affect intentions and behaviors by closely examining behavioral control. Lim and Weissmann (2021) propose two forms of control influencing individuals' behavior: covert and overt.

Covert Behavioral Control (CBC) refers to internal factors that individuals perceive as influencing their ability to engage in a specific behavior. These factors are subjective and include personal beliefs, self-perceptions, habits, emotions, and cognitive processes. Covert control reflects an individual's perception of barriers or facilitators within their internal environment. For instance, self-efficacy beliefs, which represent one's confidence in their ability to perform a behavior, serve as a form of covert behavioral control. When individuals possess higher levels of self-efficacy, they perceive greater control over their behavior, leading to an increased likelihood of engagement.

Overt Behavioral Control (OBC) pertains to external factors and influences that directly impact an individual's ability to engage in a particular behavior. These factors are typically tangible and observable. Examples of overt behavioral control include legal frameworks, regulations, policies, physical barriers, environmental constraints, and established rules. Overt control can either facilitate or impede behavior performance. For instance, the provision of bike lanes facilitates cycling behavior, while a lack of available parking spaces hinders car use. Overt control is usually imposed by external entities or institutions and holds significant sway over individuals' behavioral decisions.

This research aims to build upon this foundational research by examining how these behavioral control factors evolve over time. By tracking the same participants from the initial study over several years, this research seeks to provide deeper insights into the sustainability and long-term impact of behavioral control on agripreneurial intentions. This

longitudinal approach will offer a more dynamic understanding of the interplay between internal and external control factors and their influence on the entrepreneurial journey in agriculture.

Figure 1
Conceptual framework of theory of behavioural control on entrepreneurial intentions
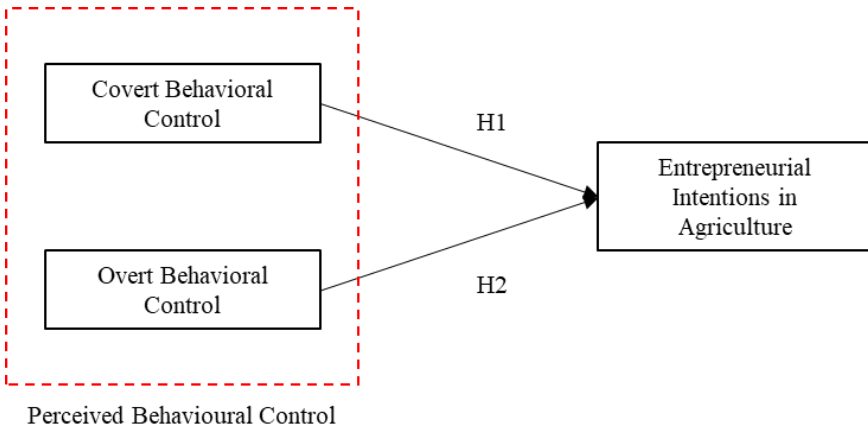
Hypothesis Development

The goal of the study is to provide a thorough knowledge of how overt and covert behavioral control variables interact with the intention to engage in agripreneurship, a crucial component of agricultural entrepreneurship. The main goal is to find out how both overt and covert behavioral control mechanisms affect people's decisions to start their own businesses in agriculture. The goal of this study is to understand the distinct influences of overt behavioral control, which includes external factors such as socioeconomic conditions and policy support, and covert behavioral control, which includes internal factors like personal motivations, values, and perceived self-efficacy, on the intention to engage in agripreneurship. This study this study will take a longitudinal approach to assess how these influences evolve over time. By tracking the same participants over several years, the study aims to provide deeper insights into the sustainability and long-term impact of these behavioral control factors on agripreneurial intentions.

Two hypotheses are investigated in this paper:

H1: Covert behavioral control will significantly affect an individuals' intentions to pursue agripreneurship.

H2: Overt behavioral control will significantly affect an individuals' intentions to pursue agripreneurship.

METHODOLOGY

This study is rooted in a quantitative paradigm. This paradigm was chosen due to its utility in testing hypotheses and uncovering relationships between variables. As the focus of the study is to understand how overt and covert behavioural control variables shape intentions to pursue agripreneurship, the quantitative approach is deemed most fitting for collecting structured and scalable data that facilitates objective analysis.

Data Collection and Sampling

The research aims to understand the intentions and perspectives of individuals either deeply interested in or actively participating in agricultural pursuits. The sample size is 300 participants. The rule of thumb for the typical sample size when applying the Structure Equation Model (SEM) is to have at least 200 (Kline, 2011). Hence, the sample size for the current study is acceptable. This population encompasses students enrolled in agricultural programs, attendees of agricultural seminars, subscribers to farming journals, members of agricultural online communities, as well as professionals firmly embedded in the sector such as farmers, agripreneurs, and agronomists. Outreach efforts were channelled through social media, community bulletin boards, and local agricultural events to ensure a diverse respondent pool. Data was gathered using a structured questionnaire that draws inspiration from the Theory of Behavioural Control. The instrument was divided into four main sections as show in the
Table 1

Table 1
Instrumentation of questionnaires

Section	Questions

Demographics	Q1: Gender, Q2: Age, Q3: Educational Background Q4: Current Occupation
Covert Behavioural Control (CBC)	Q5: I feel influenced by societal expectations to pursue a traditional career path rather than agripreneurship. Q6: The opinions of my family and friends strongly influence my decision to pursue agripreneurship. Q7: I am concerned about the financial risks associated with agripreneurship, which affects my decision. Q8: The lack of available resources and support systems discourage me from pursuing agripreneurship. Q9: The fear of failure in agripreneurship significantly affects my decision-making process. Q10: I feel pressured to conform to societal norms and expectations, which influence my decision to pursue agripreneurship.
Overt Behavioural Control (OBC)	Q11: Government policies and incentives play a significant role in encouraging agripreneurship. Q12: The availability of financial support and loans specifically for agripreneurship positively influences my decision. Q13: The presence of successful role models in the field of agripreneurship motivates me to pursue it. Q14: Access to training programs and educational resources related to agripreneurship is crucial in influencing my decision. Q15: I believe that access to agricultural markets and distribution networks significantly affects my decision to pursue agripreneurship. Q16: The availability of infrastructure and technology for agripreneurship positively influences my decision.
Entrepreneurial Intention	Q17: I am ready to do anything to be an agripreneur. Q18: My professional goal is to become an agripreneur. Q19: I will make every effort to start and run my own agriculture business. Q20: I am determined to create an agriculture business in the future. Q21: I have very seriously thought of starting an agriculture business. Q22: I have the firm intention to start an agriculture business someday.

For Statement in Section 1, respondents are asked to respond to the questions with different options. All the remaining statements in Section 2-4, respondents are asked to express their agreement or disagreement on a 7-

point Likert scale, where 1 denotes 'Strongly Disagree' and 7 signifies 'Strongly Agree'.

Data Analysis

Data, collected from individuals engaged in agricultural pursuits, will first undergo preliminary analysis in statistical software SPSS 26. After ensuring data integrity through missing value treatment and outlier detection, descriptive statistics will detail the dataset's central tendencies. The tool will then facilitate an Exploratory Factor Analysis, which affirmed the questionnaire's construct validity. This was followed by a reliability assessment via Cronbach's alpha to ascertain response consistency. Transitioning to Smart-PLS software (4.0 version) for nuanced insights, the study will evaluate the measurement model, emphasizing individual item reliability, construct reliability, and both convergent and discriminant validity. SEM-PLS was also used to examine the hypothesis through Smart-PLS software (4.0 version), due to its ability to incorporate latent variables and complicated path models (factors) (Dash & Paul, 2021). This method was more appropriate for the system of interactions between constructs than a dependent factor with a collection of independent variables (Dash & Paul, 2021). SEM-PLS was also considered a method to minimize the residual variance of the endogenous variable (Hair et al., 2021). Furthermore, a partial least square was selected due to its potential to explain the theory and prediction of human behavior (Hair Jr et al., 2014). This approach was used in wide sampling and replicative variables and did not require a normal distribution of data (Hair Jr et al., 2014). The structural model will then be probed, with R-squared values highlighting variance explanation in endogenous constructs and bootstrapping gauging path significance. This dual-software approach seeks to robustly discern relationships between CBC and OBC factors and their influence on agripreneurial intent.

FINDINGS

The descriptive statistics in Table 2 show that the sample predominantly consists of males, with a mean gender value of 1.2867 (where 1 represents male and 2 represents female) and a standard deviation of 0.46122. The average age of participants is in the mid-range category, with a mean of 3.3033 and a standard deviation of 1.02543. This indicates a diverse age

range. The educational background has a mean of 3.0633, suggesting that the participants generally have a higher-than-secondary level of education, with a standard deviation of 2.10233 showing significant variation in educational levels. The current occupation mean of 3.3567 indicates that most participants are employed in non-agricultural sectors, and the standard deviation of 1.09121 reflects some diversity in employment types.

Table 2
Descriptive statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Gender	300	1.2867	0.46122	1.00	2.00
Age	300	3.3033	1.02543	1.00	5.00
Educational Background	300	3.0633	2.10233	1.00	7.00
Current Occupation	300	3.3567	1.09121	1.00	5.00

Table 3
Collinearity statistics

	Tolerance	VIF
Covert Behavioural Control	.275	3.636
Overt Behavioural Control	.281	3.557

Based on the results, two independents did not contain multicollinearity, with a tolerance value > 0.1 and a variance inflation factor (VIF) < 10, as exhibited in Table 3. The longitudinal analysis confirms the stability of key constructs, with consistent reliability and validity measures. The significant influence of covert behavioural control on entrepreneurial intention in agriculture underscores its critical role. Meanwhile, overt behavioural control remains a marginal but consistent predictor. These findings highlight the robustness of the study's constructs and their relevance over time, indicating reliable and stable relationships among the variables.

Using SEMPLS analysis, several processes were implemented to examine the hypothesis through the validity and reliability tests. Some

measurements were also observed in SEM, such as internal consistency and indicator reliabilities, as well as convergent and discriminant validities.

Table 4
Validity and reliability

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Covert Behavioural Control	0.859	0.878	0.896	0.583
Overt Behavioural Control	0.852	0.855	0.892	0.575
Entrepreneurial Intention in Agriculture	0.927	0.927	0.943	0.726

For internal consistency, the value of Cronbach's alpha was used in assessing the items of the construct. In this case, various scholars stated that the threshold and acceptable value for Cronbach's alpha was 0.6 (Hair et al., 2021). Additionally, some measurements also required clarification. According to (Wang et al., 2022), the values of various measurements were suggested, namely rho_A > 0.7, composite reliability (CR) > 0.8, and average variance extracted (AVE) > 0.50. However, (Fornell & Larcker, 1981) suggested the following analytical values, CR > 0.7 and AVE > 0.36. Based on these criteria, the constructs of covert behavioural control, overt behavioural control and entrepreneurial intention in agriculture were acceptable for the values of Cronbach's alpha, composite reliability, and AVE, which exceeded the standard coefficients Table 4. From the results, discriminant validity was evaluated by comparing the AVE square root for each construct against the inter-construct correlation. All constructs maintained high levels of reliability and validity over time. Minor improvements in Cronbach's alpha and composite reliability indicate consistent and reliable measures across both time points.

Table 5
Discriminant validity

	Covert Behavioural Control	Overt Behavioural Control	Entrepreneurial Intention in Agriculture
Covert Behavioural Control	0.763		
Entrepreneurial Intention in Agriculture	0.849	0.754	
Overt Behavioural Control	0.829	0.851	0.758

In Table 5, all the diagonal elements (square root of AVE) exceeded the inter-construct correlation, and the discriminant validity was acceptable. The AVE square root for each construct continued to exceed inter-construct correlations, indicating stable discriminant validity.

Table 6
Path coefficients and results of hypotheses

	Path coefficient (β)	Standard deviation	t-statistics	p-value
Covert Behavioural Control $\rightarrow$ Entrepreneurial Intention in Agriculture	0.671	1.000	7.799	0.000
Overt Behavioural Control $\rightarrow$ Entrepreneurial Intention in Agriculture	0.185	1.000	1.837	0.066

To test the significance level, the path relationships were analyzed using the regression coefficient value (β). The significance of the regression coefficient was determined through the t-statistic or p-value using the bootstrapping process in the software. Based on the t-statistic value, the hypothetical outputs were obtained and presented in Table 6. In this case, a hypothesis was supported when the significance was at least at a 95% level.

According to Table 6, capital resource ($\beta = -0.359$, $t = 3.969$), attitude ($\beta = 0.466$, $t = 5.649$), and subjective norm ($\beta = 0.576$, $t = 4.865$) were significant, indicating that the hypotheses were supported. Meanwhile, PBC ($\beta = -0.052$, $t = 1.102$) was insignificant, emphasizing the rejection of the hypotheses.

Figure 2
The path diagram
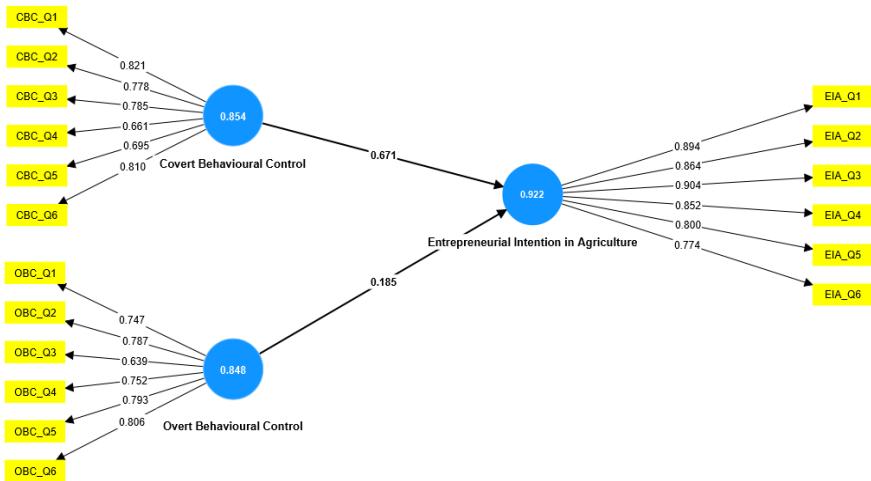
The significant positive impact of covert behavioural control on entrepreneurial intention in agriculture was consistent across both time points. Overt behavioural control showed a marginally significant impact, maintaining a stable but less pronounced effect over time.

DISCUSSION

This longitudinal study makes a significant theoretical contribution by explaining the distinct roles of covert and overt behavioral controls in shaping entrepreneurial intentions in agriculture. By demonstrating that covert behavioral control consistently exerts a significant positive impact on entrepreneurial intention, the research underscores the importance of intrinsic forms of control in entrepreneurial behavior. This finding expands the understanding of how different types of behavioral control influence entrepreneurship, particularly in agriculture. The stability of these constructs over time reinforces their validity and reliability, providing a robust framework for future research. Additionally, the study's findings on the relative insignificance of overt behavioral control challenge existing assumptions and call for a reevaluation of its role in entrepreneurial motivation. This nuanced understanding contributes to the broader

discourse on entrepreneurial psychology and behavior, offering new avenues for theoretical exploration and refinement.

Practically, this study offers valuable insights for policymakers, educators, and practitioners aiming to foster entrepreneurial intentions in the agricultural sector. The significant impact of covert behavioral control suggests that initiatives should focus on enhancing internal motivations and intrinsic factors among potential entrepreneurs. Programs that cultivate self-efficacy, internal motivation, and personal empowerment could be particularly effective. Furthermore, the study's identification of significant predictors such as capital resources, attitude, and subjective norms highlights the need for comprehensive support systems that address financial, attitudinal, and social factors. Tailored interventions in these areas can create a more conducive environment for agricultural entrepreneurship. These practical insights can guide the development of targeted training programs, policy frameworks, and support mechanisms, ultimately contributing to the growth and sustainability of the agricultural entrepreneurship landscape.

RECOMMENDATIONS

Based on the findings of this longitudinal study, several key recommendations can be made to foster entrepreneurial intentions in the agricultural sector. First, educational programs and training workshops should focus on enhancing covert behavioral control by building intrinsic motivation and internal control among potential entrepreneurs. This can be achieved through mentorship schemes, self-efficacy training, and activities that promote personal empowerment and resilience.

Second, developing comprehensive support systems is essential. Financial support mechanisms, such as grants, loans, and subsidies, should be made accessible to aspiring agricultural entrepreneurs. Additionally, fostering positive attitudes towards entrepreneurship through awareness campaigns and success stories can enhance its attractiveness.

Third, promoting positive subjective norms is crucial. Creating a supportive community environment through engagement programs,

networking events, and peer support groups can encourage entrepreneurial activities by providing a platform for sharing experiences and resources.

Fourth, targeted educational interventions are needed. Educational institutions should integrate entrepreneurship modules into their curricula, focusing on practical skills, business management, innovation, and the use of technology in agriculture. Collaboration with industry experts can provide students with real-world insights and practical knowledge.

Fifth, policymakers should implement policies that create a favorable environment for agricultural entrepreneurship, including reducing bureaucratic hurdles, providing tax incentives, and ensuring easy access to land and resources. Policies should also address the unique challenges faced by agricultural entrepreneurs, such as climate change and market volatility.

Finally, continuous research is necessary to understand the evolving dynamics of agricultural entrepreneurship. Institutions should invest in research exploring new trends, technologies, and methods to enhance productivity and sustainability in agriculture. Collaboration between research institutions, governments, and the private sector can lead to innovative solutions and improved practices.

LIMITATIONS

This study has several limitations. First, the predominance of male participants may limit the generalizability of the findings across genders. Second, the self-reported data may be subject to biases such as social desirability and recall bias. Third, focusing on a specific geographical region may limit the applicability of the findings to other contexts. Fourth, the longitudinal design, while insightful, may miss relevant changes due to fixed intervals. Lastly, external factors such as economic conditions and policy changes were not controlled, potentially influencing the results.

FUTURE STUDIES

Future studies should incorporate a more diverse and balanced sample in terms of gender, age, and geographical regions to enhance generalizability. Longitudinal designs should include more frequent data collection intervals to capture dynamic changes more accurately. Additionally, future research should employ mixed-method approaches, combining quantitative data with qualitative insights to deepen understanding of the mechanisms driving entrepreneurial intentions. Investigating the impact of external factors such as economic conditions, policy changes, and technological advancements on agricultural entrepreneurship can provide a more comprehensive view. Exploring the role of digital transformation and innovative technologies in enhancing entrepreneurial activities in agriculture can be valuable. Lastly, examining the effectiveness of specific interventions aimed at improving covert and overt behavioral controls can offer practical guidance for developing targeted support programs for aspiring agricultural entrepreneurs.

CONTRIBUTION OF AUTHORS

The authors confirm the equal contributions in all parts of this work. Both authors reviewed and approved the final version of this manuscript.

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CONFLICT OF INTEREST

Both authors declare no conflicts of interest.

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