Agro Bali : Agricultural Journal
Vol. 8 No. 2: 512-524, July 2025

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v8i2.1996

Drives of Agricultural Entrepreneurship: A Scoping Review

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Article history: submitted: August 13, 2024; accepted: February 28, 2025; available online: July 28, 2025

Abstract. Agricultural entrepreneurship has the potential to drive economic development. Identifying the factors that influence the orientation towards agricultural entrepreneurship can aid in designing intervention programs that encourage farmers to develop entrepreneurship in the agricultural sector. This study aims to review scholarly articles related to the factors that promote entrepreneurial orientation in the agricultural field. A Scoping Review was conducted with the following eligibility criteria: a) academic articles from Scopus, Science Direct, Ebsco, and Wiley, b) articles published within the last 10 years, from 2015 to 2024, c) written in English, d) the study population are farmers, and e) the measured impact is agricultural entrepreneurship. Article management was done using Mendeley with a four-stage article selection process, including identification, screening, eligibility, and inclusion. Over the past 10 years, there have been 12 articles related to the factors driving farmers' entrepreneurial orientation, with seven variables most frequently identified: knowledge support, market access, networks, association membership, experience, risk-taking, access to internet, and radio. Knowledge support provides crucial information and skills for decision-making and opportunity utilization. Market access enhances farmer entrepreneurship by providing information and value-added services. Participation in farmer associations improves skills, information access, business mindset, and technology adaptation. Experience and risk-taking form a strong foundation for entrepreneurial behavior, enabling the identification of opportunities, development of innovative solutions, and risk management. Access to the internet and radio serves as a medium for farmers to obtain agricultural information.

Keywords: agripreneurship; knowledge support; market access; risk-taking

INTRODUCTION

The spirit of entrepreneurship really needs to be developed because it is an activity that plays a role in the national economic system, as well as a motor for the economic progress of a country (Syamsuri *et al*., 2022). Entrepreneurship research focuses on understanding the why, when, and how individuals recognize and seize opportunities (Shane & Venkataraman, 2000). Entrepreneurship is more than just a career choice; it's a lifestyle and a perspective. Entrepreneurs value their independence and the freedom to make their own decisions about what to do and when to do it. They also confront risks, work under pressure, and are directly responsible for the results whether positive or negative of their choices. For farmers to cope with the risks they will face in the complex world in which they compete, they need to develop an entrepreneurial spirit. A farmer with an entrepreneurial spirit energetically, enthusiastically and carefully makes many different decisions about his farm in the context of the value chain that influences the profits of the farm business. This is all happening in a dynamic, ever-changing and uncertain setting (Kahan, 2012).

Small-scale farmers are essential to society and food security. Small-scale farmers are agricultural producers who operate on limited land, typically less than 2 hectares (Verschelde *et al*., 2013). They are distinguished by their reliance on family labor, traditional farming practices, and a primary focus on subsistence farming or local markets, with approximately 70% of their produce directed toward human consumption (Samberg *et al*., 2016). Their farming systems and practices vary significantly based on regional and socio-economic

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v8i2.1996

conditions, shaping their production methods and economic viability (Adzawla *et al*., 2022). Farmers need to experiment, take calculated risks and make investment decisions that are responsive to changing market and environmental conditions (Manyise & Dentoni, 2021). Entrepreneurial behaviour in the agricultural sector, could have the way for improving the smallholder farmer performance (Wale *et al*., 2021). Small-scale farmers perceive their future as bleak unless they become more entrepreneurial in managing their farms (Arellano & Reyes, 2019). Entrepreneurship for smallholder farmers results in increased access to finance, increased productivity through technology adoption, increased income levels, and better educational opportunities, ultimately leading to poverty alleviation and greater economic and social well-being for smallholder farmers (Sandhu & Hussain, 2020). The agriculture sector presents significant challenges, particularly for smallholders, to start an entrepreneurial venture (Dias *et al*., 2019).

The literature uses different terminologies to refer to the creation of agricultural ventures, such as agricultural entrepreneurship, agrientrepreneurship and agripreneurship. Agricultural entrepreneurship or agripreneurship is the capability of an individual to identify a lucrative agribusiness opportunity and establish a venture that integrates innovation to ensure successful agribusiness (Otache, 2017; Pindado & Sánchez, 2017). Agricultural entrepreneurship is currently necessary to address the slow growth in agriculture and achieve higher productivity and profitability in farming (Bairwa *et al*., 2014). Agricultural entrepreneurship is any form of business carried out by individuals or groups in managing their agricultural resources in a creative, innovative, market-oriented manner and with the courage to take risks in order to meet their needs (Nadapdap, 2020). According to Korsgaard & Tanvig (2015), agricultural entrepreneurship involves a particular engagement with the rural natural environment, which presents specific challenges for these entrepreneurs, such as low human and financial capital, relatively small markets, and poor communication. The lack of training and capacity building as an important barrier for entrepreneurship agriculture (W. Cheng & Adejumo, 2021). Moreover, the expensive nature of agricultural inputs, such as seeds, fertilizers, and equipment, poses challenges for entrepreneurs seeking to launch or grow their farming businesses (Ollinaho & Kröger, 2021). Entrepreneurship in the agricultural sector has attracted the attention of researchers and policymakers due to its potential to drive economic development, promote innovation, and enhance food security. Agricultural entrepreneurship refers to the ability of farmers to recognize profitable business opportunities, integrate innovation, and demonstrate entrepreneurial behaviors such as independence, creativity, competitiveness, and risk-taking in farm management (Graskemper *et al*., 2021; Maesela *et al*., 2024; Rahmawati & Waluyati, 2018; Wale *et al*., 2021).

Agricultural entrepreneurship involves developing entrepreneurial skills, being market-oriented, and aiming to achieve profit by efficiently using resources and engaging in activities that add value to agricultural products (Bannor *et al*., 2021). Agricultural entrepreneurship is influenced by various factors that have been explored in several studies. Internal factors, such as farmers' attitudes towards entrepreneurship, and external factors, such as family support and social networks, are crucial for developing sustainable agriculture Knapp et al., 2021). Additionally, the theory of planned behavior, which includes personality traits, suggests that entrepreneurial commitment, confidence in communication, and entrepreneurial attitudes significantly influence entrepreneurial intentions in agriculture, especially among young farmers (Rahmawati *et al*., 2021). This research intends to bring insights for the understanding of agricultural entrepreneurship, specifically, about factors

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v8i2.1996

to drives of agricultural entrepreneurship. Therefore, the purpose of this research is to synthesize existing knowledge regarding the factors that drive farmers to engage in entrepreneurship in the agricultural sector.

METHODS

The methodology for this scoping review was based on the framework outlined by Arksey & O'Malley (2005). The scoping review method provides a structured approach to mapping existing literature and identifying research gaps across various fields. It is particularly advantageous for synthesizing diverse studies, facilitating the exploration of broad topics, and informing future research directions. Among its key benefits, scoping reviews offer a comprehensive overview by incorporating various study designs and methodologies (Pairon *et al*., 2023). It also enables the identification of research gaps, which is crucial for rapidly evolving knowledge areas (Blakeney *et al*., 2024). Additionally, its flexibility in methodology allows adaptation to different research questions and contexts (Milte *et al*., 2023). However, scoping reviews also present challenges, including the heterogeneity of studies**,** which can complicate data synthesis and limit the transferability of findings (Blakeney *et al*., 2024). Another limitation is quality assessment challenges, as the lack of rigorous evaluation across included studies can undermine the reliability of conclusions (Essex *et al*., 2023). Furthermore, the potential for bias in study selection and data extraction may affect the overall validity of the findings (Howie *et al*., 2023). Despite these limitations, scoping reviews remain a valuable methodological approach provided that help implement strategies to enhance study quality and mitigate potential biases.

This scoping review method included the following five key phases: (i) identifying the research question; (ii) identifying relevant studies; (iii) study selection; (iv) charting the data; (v) and collating, summarizing, and reporting the results. The research question in this article review is what drives farmers to become entrepreneurs. To identify relevant studies and study selection, the scoping review method was conducted in two stages: establishing the eligibility criteria for the study and searching for articles. The eligibility criteria for the study included: a) academic articles from online databases such as Scopus, ScienceDirect, Ebsco, and Wiley, b) articles published within a 10-year period, from 2015 to 2024, c) written in English, d) the study population being farmers, and e) the measured impact being the decision to engage in agricultural entrepreneurship. Articles were managed using Mendeley. The article selection process involved four stages: identification, screening, eligibility, and inclusion. The subsequent phase of the work involved "charting" key information gathered from the primary research reports under review. The information obtained include: author, year of publication, study location, study populations, methodology and important results (see table 1 and table 2). The last stage of a scoping study involves collating, summarizing and reporting the results. The data were compiled in a single spreadsheet and imported into Microsoft Excel 2010 (Microsoft Corporation). The scoping study seeks to present an overview of all material reviewed and consequently issues of how best to present this potentially large body of material are critical and the scoping study does not seek to 'synthesize' evidence or to aggregate findings from different studies (Arksey & O'Malley, 2005).

Figure 1 is the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flowchart of study selection process that can be used in the scoping review as a guide in article selection explaining that from the online database obtained there are 369 articles which are then selected related to articles that have duplication with articles obtained from each database so that 23 articles are excluded and 346 articles are obtained that do not have similarities. Of the 346 articles obtained, selected based on the feasibility of agricultural entrepreneurship

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v8i2.1996

topics, 23 articles were obtained from the screening results that followed the PEO framework, with farmers as the population, factors as the exposure, and entrepreneurship as the outcome. A comprehensive journal search was performed across Scopus, ScienceDirect, EBSCO, and Wiley to identify relevant studies. The search strategy used a combination of keywords: "factor" AND "entrepreneurship" AND ("agriculture" OR "farming), ensuring a broad yet targeted selection of articles. A total of 369 articles were initially retrieved, with 112 from Scopus, 150 from ScienceDirect, 5 from EBSCO, and 102 from Wiley. After removing duplicates, 346 articles remained for the screening process. During the screening, 323 articles were excluded based on title and abstract reviews, as they did not align with the study's objectives. The article eligibility stage is carried out by looking at the content of the article against the suitability of the research objectives so that 12 articles are suitable for analysis. Data extraction and analysis were conducted at the final stage, i.e. inclusion, for each selected article.

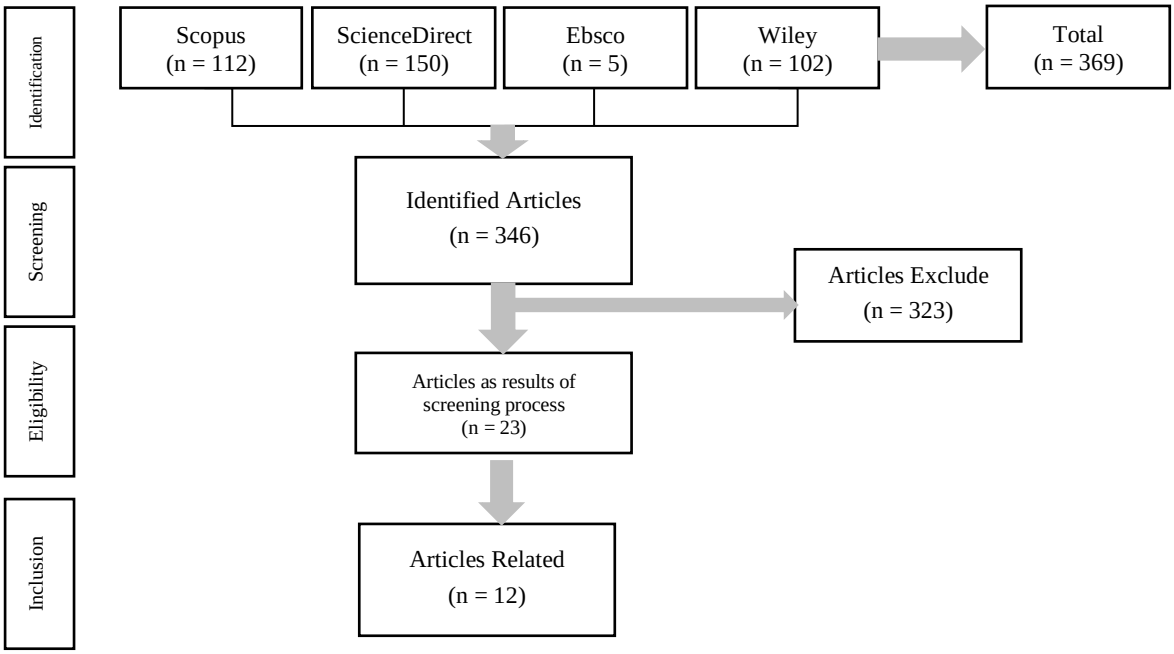

Figure 1. PRISMA Flowchart of Study Selection Process.

RESULTS AND DISCUSSION

In the past 10 years, from 2015 to 2024, there have been 12 articles related to factors influencing farmers' decisions to engage in agricultural entrepreneurship. The most recent article was published in 2024, while the oldest was published in 2015. The research period for these articles' spans from 2015 to 2022. The study locations include Nigeria, South Africa, Germany, Ghana, Switzerland, Indonesia, and China. All the articles used Cross-Sectional methods, with sample sizes ranging from 72 to 6,060 farmers. The sampling methods included stratified random sampling, simple random sampling, multistage probability sampling, and purposive sampling. The data sets used in the research include primary data collection through household surveys, the 2020 China Family Panel Studies database, and the 2020-2022 Jiangsu Farmers' Household Survey.

The research identified factors that drive agricultural entrepreneurial orientation, which were categorized into 25 factors, including knowledge support (1)(2)(4)(5)(8)(11), market access

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v8i2.1996

(1)(2)(4)(5)(7)(8), networks (2)(5)(7), association membership (1)(4)(7), experience (2)(5)(8), risk-taking (3)(6)(9), Access to internet and radio (8)(9)(12), technological innovation (1)(5), location and land size (1)(5), training and extension services (2)(12), age (3)(5), gender (4)(5), number of family members (5)(12), locus of control (6)(10), capital (7)(12), production (1), government support (2), family involvement (3), income (4), personal commitment (5), non-agricultural employment (5), skills (7), social capital (8), leadership (10), and information-seeking behavior (12).

Table 1. Article Characteristic

No	Author	Research Period	Location	Method	Sampling Method	Sample Size	Data Set
1	Apata (2015)	2015	Nigeria	Cross Sectional	Simple Random Sampling	200	Primary data collection
2	Mumuni & Oladele (2016)	2016	Ghana	Cross Sectional	Purposive Sampling	301	Primary data collection
3	Rahmawati & Waluyati (2018)	2018	Bantul, Indonesia	Cross Sectional	Purposive Sampling	123	Primary data collection
4	Wale *et al.*, (2021)	2015-2016	South Africa	Cross Sectional	Stratified sampling	458	Primary data collection
5	Bannor *et al.*, (2021)	2016	Ghana	Cross Sectional	Simple Random Sampling	134	Primary data collection
6	Knapp *et al.*, (2021)	2018	Swiss	Cross Sectional	N/A	568	Primary data collection
7	Graskemper *et al.*, (2021)	2018-2019	Germany	Cross Sectional	N/A	745	Primary data collection
8	Mubarak *et al.*, (2021)	2020	Indonesia – Malaysia	Cross Sectional	Purposive Sampling	200	Primary data collection
9	Rahmawati *et al., (*2021)	2021	Demak, Indonesia	Cross Sectional	Simple Random Sampling	72	Primary data collection
10	Lin *et al.*, (2024)	2020	China	Cross Sectional	Multi-stage Probability Sampling	4057	2020 China Family Panel Studies database
11	Cheng *et al.*, (2024)	2020-2022	China	Cross Sectional	Stratified sampling	6060	2020-2022 Jiangsu Farmers' Household Survey
12	Maesela *et al.*, (2024)	2021-2022	South Africa	Cross Sectional	Stratified sampling	200	Primary data collection

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v8i2.1996

Table 2. Factors that promote agriculture entrepreneurship

No	Writers	Factors Related
1	Apata (2015)	Education level, number of family members, radio ownership, information-seeking behavior, credit access, and extension participation
2	Mumuni & Oladele (2016)	Knowledge support
3	Rahmawati & Waluyati (2018)	Education, Experience, Training, Market Orientation, Networks, and Government Support
4	Wale *et al*., (2021)	Knowledge Support, Market Access, Association Membership, Gender, Income
5	Bannor *et al*., (2021)	Personal commitment, market information, knowledge, networks in the value chain, age, education, gender, number of family members, technology, land size, non-agricultural employment
6	Knapp *et al*., (2021)	Risk-taking, locus of control
7	Graskemper *et al*., (2021)	Age, Risk-Taking, Family Involvement, specifically the involvement of the farmer's spouse
8	Mubarak *et al*., (2021)	Risk-taking, *Locus of Control*, leadership
9	Rahmawati *et al*., *(*2021)	Skills, capital, market orientation, partners and relationships
10	Lin *et al*., (2024)	rural E-commerce, education, experience, social capital, influence of the internet
11	Cheng *et al*., (2024)	Internet Influence
12	Maesela *et al*., (2024)	Technological Innovation, Knowledge Support, Market Access, Association Membership, Land Location, Production

The results of this study identify several variables that influence agricultural entrepreneurship, including knowledge support, market access, networks, association membership, experience, risk-taking, the Internet and radio, technological innovation, location and land size, training and extension services, age, gender, number of family members, locus of control, capital, production, government support, family involvement, income, personal commitment, non-agricultural employment, skills, social capital, leadership, and information-seeking behavior. Among these 25 factors, 7 were most frequently identified as influencing entrepreneurship: knowledge support, market access, networks, association membership, experience, risk-taking, and access to internet and radio.

Knowledge support plays a crucial role in enhancing agricultural entrepreneurship by providing the information and skills necessary for farmers to make informed decisions, seize opportunities, and improve adaptability to new technologies (Bannor et al., 2021). Access to extension services, market information, and knowledge about value addition has been shown to positively affect farmers' entrepreneurship (Lin *et al*., 2024; Wale *et al*., 2021). Additionally, sharing information about agriculture and marketing through platforms such as farmer associations can help farmers develop a business mindset and treat farming as a

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v8i2.1996

business rather than just a practice (C. Cheng *et al*., 2024; Rahmawati & Waluyati, 2018). Furthermore, knowledge support can enhance farmers' entrepreneurial skills, improve adaptability to new technologies, and strengthen the ability to transform opportunities into innovative ideas, ultimately leading to entrepreneurial success (Apata, 2015). Current technologies provide convenience in the agricultural business climate, from the production process to marketing agricultural products (Nadapdap, 2020).Therefore, promoting interactive learning, providing targeted entrepreneurial training, and facilitating access to market information are key strategies for fostering agricultural entrepreneurship and boosting economic development.

Market access plays a crucial role in influencing agricultural entrepreneurship by reducing transaction costs and providing opportunities for farmers to achieve satisfactory outcomes from their agricultural efforts (Mubarak *et al*., 2021). Market access allows farmers to engage in entrepreneurial activities more effectively, as it enables them to explore various opportunities and obtain positive results from their agricultural ventures (Lin *et al*., 2024). Additionally, access to market information provides farmers with insights into modern technologies, market trends, and consumer demand, which ultimately enhances entrepreneurial behavior (Graskemper *et al*., 2021). Furthermore, market access is vital for farmers to actively participate in the agricultural sector, fostering growth and sustainability in agricultural entrepreneurship (Wale *et al*., 2021).

A broad network of cooperation can positively impact entrepreneurial behavior by facilitating knowledge sharing, resource gathering, and market access (Rahmawati *et al*., 2021). In agribusiness systems, strong networking with value chain actors significantly impacts farmers' entrepreneurial scores (Bannor *et al*., 2021). Farmers can obtain networks through participation in farmer organizations. Farmer associations are valuable resources that can provide various supports, such as information through extension services, market information, and networking opportunities, which are crucial for fostering entrepreneurial behavior among farmers (Lin *et al*., 2024). Agricultural cooperatives are a form of structured social networks intended to enhance bargaining power. The presence of entrepreneurial farmers within cooperatives can also facilitate interactive learning and influence other farmers' behavior, thereby promoting entrepreneurship in the agricultural sector (Wale *et al*., 2021). Overall, active participation in farmer associations not only cultivates a business mindset among emerging farmers but also facilitates access to critical resources and information needed for sustainable and profitable agricultural businesses (Mumuni & Oladele, 2016; Rahmawati & Waluyati, 2018). Age can influence entrepreneurship by shaping networks (Shahin, Sarmin, Sojib, *et al*.,2024). Older entrepreneurs may have larger professional networks and access to resources such as capital, mentorship, and industry connections.

Participation in farmer organizations plays a significant role in enhancing agricultural entrepreneurship by providing a platform for knowledge sharing, skill development, and access to business opportunities (Mubarak *et al*., 2021). Farmer associations are valuable resources that can offer various supports, such as information through extension services, market information, and networking opportunities, which are essential for nurturing entrepreneurial behavior among farmers (Lin *et al*., 2024). By working in groups, they could use networks to find partners (investors) with whom they can cooperate (Analia et al., 2020). Additionally, the presence of strong partnerships and relationships within these associations positively affects the entrepreneurial character of farmers, leading to increased entrepreneurial success and market orientation (Graskemper *et al*., 2021).

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v8i2.1996

Overall, active participation in farmer associations not only cultivates a business mindset among emerging farmers but also facilitates access to critical resources and information needed for sustainable and profitable agricultural businesses (Mumuni & Oladele, 2016; Rahmawati & Waluyati, 2018).

Experience plays a crucial role in influencing agricultural entrepreneurship by shaping farmers' entrepreneurial behavior and decision-making processes. Research indicates that more experienced farmers tend to exhibit stronger entrepreneurial behavior due to learning from past successes and failures, which helps them make informed choices in agricultural practices (Mubarak *et al*., 2021; Wale *et al.,* 2021). Learning from experience helps farmers identify entrepreneurial opportunities, develop innovative solutions, and address challenges in the agricultural sector, ultimately leading to a more entrepreneurial approach to farming activities (Rahmawati & Waluyati, 2018). Farmers with extensive work experience also show greater acceptance of new things and are more likely to engage in e-commerce activities. Participation in e-commerce is also an early form of experience that can make farmers more aware of low costs, low entry thresholds, and market mechanisms for selling agricultural products online, as well as accumulate previous experience in e-commerce entrepreneurship, which can contribute to farmers' entrepreneurial behavior (Lin *et al*., 2024).

Studies show that a higher tendency for risk-taking can drive farmers to pursue entrepreneurial strategies focused on expansion and diversification rather than maintaining existing conditions (Maesela *et al*., 2024). Additionally, risk preference, personality traits, and aspirations significantly contribute to farmers' economic choices, with risk preference and locus of control being key predictors for entrepreneurial decisions, such as involvement in processing and direct marketing (Knapp *et al*., 2021). Moreover, entrepreneurial variables in agriculture are shaped by risk-taking behavior as a significant coefficient in forming overall entrepreneurial variables, underscoring the importance of encouraging entrepreneurial initiatives among farmers (Graskemper *et al*., 2021). Farmers' understanding of risk is very important to anticipate and avoid risk through reactive actions and taking adaptive actions (Nadapdap *et al*., 2020). The risk management practices applied by farmers in running their farming businesses demonstrated the decisions and steps taken to control the risks faced in farming activities (Fariyanti *et al*., 2024). Overall, managing risk can empower farmers to explore new business strategies, enhance agricultural activities, and drive innovation in the agricultural sector. Entrepreneurial farmers are more willing to take risks and proactively explore market opportunities (Etriya *et al*., 2018).

Information media are essential for farmers in seeking and obtaining information. The information media used by farmers in the literature reviewed include the internet and radio ownership. Digital internet skills empower farmers by allowing access to timely and accurate agricultural information. Farmers' ability to access the internet represents a crucial effort in searching for agricultural data, thereby facilitating better decision-making. Through digital platforms, farmers can disseminate and obtain valuable entrepreneurial information, reducing barriers and risks in agricultural ventures. Proficiency in digital skills increases farmers' willingness to engage in entrepreneurial activities and improves their performance in agricultural endeavors (C. Cheng *et al*., 2024). Additionally, farmers' access to the internet can open new entrepreneurial opportunities and help them reach broader markets (Lin *et al*., 2024) because consumer behavior has changed from traditional purchases in physical markets to online purchases (Soeyatno et al., 2024). Besides the internet, the role of radio in information media is also important for farmers, such as

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v8i2.1996

in Nigeria. Farmers who own radios and listen to programs or news have the opportunity to gain more agricultural information. Information obtained by farmers through radio implies a positive attitude towards innovation and markets, which can enhance farmers' income potential and thus improve their entrepreneurial capability. (Apata, 2015).

Since demographic variables and land size are challenging to influence through entrepreneurial development programs, government support through training and extension services to enhance farmers' entrepreneurial skills in this group is best achieved through entrepreneurship training programs focusing on market information and knowledge about value addition (Bannor *et al*., 2021), as well as digital skills as information media (C. Cheng *et al*., 2024).

The factors influencing agricultural entrepreneurship vary significantly across Africa, Asia, and Europe, reflecting differences in economic structures, technological advancements, and socio-cultural influences. While some factors like education, market access, and knowledge support appear across multiple countries, the dominant drivers differ based on regional contexts.

In African countries, namely South Africa, Ghana, and Nigeria, knowledge support and market access emerge as key drivers of agricultural entrepreneurship. South Africa places a strong emphasis on technological innovation, land location, and production, indicating a shift towards mechanization and infrastructure-based entrepreneurship. Ghana, on the other hand, highlights personal commitment, market information, and networks within the value chain, showcasing a relationship-driven business environment. In contrast, Nigeria relies heavily on radio ownership, credit access, and extension participation, suggesting that traditional media and financial inclusion play a crucial role in supporting entrepreneurship.

In Asian countries, namely Indonesia, China, and Malaysia, entrepreneurial success in agriculture is largely driven by education, market orientation, and networks. However, China stands out with a strong emphasis on rural e-commerce, social capital, and internet influence, highlighting a digital transformation in agricultural businesses. Indonesia, on the other hand, relies on government support, access to capital, and partner relationships, reflecting a policy-driven approach to entrepreneurship. Meanwhile, Indonesia and Malaysia focus more on risk-taking and leadership, indicating that personal attributes play a larger role than external support.

In European countries, such as Germany and Switzerland, agricultural entrepreneurship is shaped by individual traits and social structures rather than technological advancements or government support. Both countries emphasize risk-taking, while Switzerland incorporates locus of control, reflecting a culture of self-motivation in business decisions. Germany, in particular, highlights family involvement, especially the role of the spouse, indicating that entrepreneurship is often a household-driven initiative rather than an individual endeavor

taking, and access to internet and radio. Knowledge support provides essential information and skills for making informed decisions and seizing opportunities. Market access, by providing market information and value-added services, positively boosts farmers' entrepreneurship. Farmers' networks through associations and cooperatives can enhance market opportunities, and connections with value chain actors reflect

CONCLUSION

Only 12 articles related to factors driving agricultural entrepreneurship have been published and indexed in Scopus. Seven factors are consistently recognized as the most frequently mentioned in influencing entrepreneurial behavior among farmers: knowledge support, market access, networks, association membership, experience, risk-

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v8i2.1996

the relationships farmers have with various entities involved in the supply chain. Farmers who are active in associations can foster a business mindset among farmers and facilitate access to important resources and information needed for a sustainable and profitable farming business. Experience makes farmers have entrepreneurial behavior because the experience they have becomes capital for farmers in identifying opportunities and developing innovative solutions. Risk-taking forms the foundation of strong entrepreneurial behavior, enabling farmers to identify opportunities, develop innovative solutions, and manage risks effectively. Farmers' ability to access the internet and radio represents a crucial effort in searching for agricultural data, thereby facilitating better decision-making.

It is important to further explore the impact of these variables both individually and in combination within more specific contexts. Studies can focus on how these factors interact with one another and how their effects change over time. Future research should explore how key factors interact in different agricultural settings, such as the combined impact of knowledge support and market access on business strategies or networking and association membership on resilience and innovation. Studies should also examine digital transformation in rural farming, as internet and radio access improve decision-making. Investigating digital platforms, mobile apps, and e-commerce can enhance market access, risk management, and financial literacy among farmers. Additionally, research must address context-specific challenges, as the impact of entrepreneurial factors varies by location, farming type, financial access, and policies. Comparative studies can guide tailored policies and support systems. To encourage farmer entrepreneurship, research should focus on evidence-based interventions such as training, skill-building, mentorship, and financial support. Strengthening farmer organizations and cooperatives can further enhance knowledge-sharing, bargaining power, and market competitiveness.

ACKNOWLEDGEMENT

I would like to thank Balai Pembiayaan Pendidikan Tinggi (BPPT), Lembaga Pengelola Dana Pendidikan (LPDP), and Universitas Kristen Satya Wacana for supporting researchers to conduct postgraduate studies at IPB University.

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