

Agri-entrepreneurship in developing countries – a systematic review of smallholders' constraints

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Abstract

Purpose – Agri-entrepreneurship is considered a promising strategy to address poverty, particularly in developing countries. However, embarking on an agri-entrepreneurial venture poses significant challenges. The existing literature on agri-entrepreneurship in developing countries, particularly focusing on smallholders' constraints, is often scattered and fragmented, focusing mainly on individual barriers rather than providing a comprehensive understanding of the multifaceted constraints. Therefore, this study aims to fill the gap by conducting a systematic review to identify, categorize, and prioritize the smallholders' constraints.

Design/methodology/approach – By systematically reviewing literature retrieved from Scopus and Web of Science, published between 2013 and 2023, and following the PRISMA guidelines, this study identifies agri-entrepreneurial constraints through content analysis and categorizes and prioritizes them using thematic analysis.

Findings – This study revealed a range of constraints which are categorized into thematic areas including market-related challenges, financial constraints, limitations in human capital, institutional barriers, socio-cultural factors, technological shortcomings, and infrastructural challenges. Moreover, the study examines the role of social networks and their impacts on the livelihoods of smallholders in developing countries.

Research limitations/implications – The study's scope is limited to constraints for agri-entrepreneurship, particularly for smallholders in developing countries. The review considers English articles published between 2013 and 2023, and ABS 3 and above ranked journal articles.

Originality/value – The study systematically identifies, categorizes, and prioritizes the significant constraints to agri-entrepreneurship in developing countries by conducting a systematic review and identifying research gaps and future directions.

Keywords Agri-entrepreneurship, Smallholders' constraints, Developing countries, Systematic review

Paper type Literature review

1. Introduction

Researchers and policymakers are increasingly attracted by the potential of entrepreneurship as a strategic approach to address major global issues including unemployment, poverty, and food insecurity (Arafat *et al.*, 2020; Magagula and Tsvakirai, 2020; Yusoff *et al.*, 2019). Researchers emphasize contextualizing entrepreneurship, particularly focusing on the agriculture sector (Dias *et al.*, 2019a, b; Fitz-Koch *et al.*, 2018). This sector has significant potential to influence the SDGs, particularly in addressing poverty and hunger (Gil *et al.*, 2019; Victor Bekun and Akadiri, 2019).

Currently, approximately 700 million people globally live in extreme poverty, who earn below \$2.15/day—the internationally recognized extreme poverty threshold—with more than



half in Africa (World Bank, 2023a). The agriculture sector employs 26.6% of the global workforce and contributes 4% to the global GDP. In some developing countries it contributes around 25% to their GDP. It is significant for the major portion of the population in developing countries who rely on agriculture for their livelihoods (World Bank, 2023b).

The significant majority (around 70–95%) of the agricultural population in developing countries are small-scale farmers (smallholders), who own less than 2 hectares of land (Cheong *et al.*, 2013; Kwa, 2001). Nearly, there are 600 million smallholders constitute 70% of all farms globally (FAO, 2023). Smallholders play a vital role in society, but they are often disregarded and suffer a variety of challenges, such as lack of skills and capacity building, limited market access, lack of technology, inappropriate infrastructure, financial constraints, and lack of favorable policies (International Fund for Agricultural Development, 2013; Kahan, 2013; Zhou *et al.*, 2013).

Policymakers are particularly focusing on entrepreneurship to address poverty in rural/agricultural communities, particularly in developing economies (Dzingirai, 2021; Kimmitt *et al.*, 2020; Naminse and Zhuang, 2018). The literature uses different terminologies to refer to the creation of agricultural ventures, such as agricultural entrepreneurship, agri-entrepreneurship, agriprenueurship, agroprenueurship, and farm entrepreneurship (Dias *et al.*, 2019a; Pindado and Sánchez, 2017; Yusoff *et al.*, 2016). There has been much discussion among scholars on the definition of agri-entrepreneurship (Bairwa *et al.*, 2014; Lans *et al.*, 2020; McElwee, 2006, 2008; Pindado and Sánchez, 2017; Vik and McElwee, 2011). Otache (2017) defines agri-entrepreneurship as the capability and willingness of a person to opportunity recognition, resource mobilization, and launch an agricultural enterprise. Pindado and Sánchez (2017) define it as the decision made by an individual to create an agricultural venture. It is defined as an attempt to start an innovative agribusiness (Yusoff *et al.*, 2016). Whereas Bairwa *et al.* (2014) describe it as “the profitable marriage of agriculture and entrepreneurship”. Moreover, agricultural entrepreneurship is considered an integration of entrepreneurial activities and agricultural practices, turning farming into enterprise and farmers into entrepreneurs (Fitz-Koch *et al.*, 2018; McElwee, 2006).

The agriculture sector presents significant challenges, particularly for smallholders, to start an entrepreneurial venture (Dias *et al.*, 2019a; FAO, 2011), and the barriers are more severe in rural settings. According to Korsgaard *et al.* (2015) the rural setting creates unique challenges for entrepreneurs such as constrained access to financial and human capital, small market size, and inappropriate communication channels. A range of entrepreneurial constraints in the agriculture sector in developing countries are documented in the literature. For example, lack of financial resources is one of the important barriers agri-entrepreneurs face in developing countries (Thanh and Duong, 2022). Esiobu and Ibe (2015) highlighted several obstacles to agri-entrepreneurs such as lack of access to information, knowledge, finance, and distance from the market. Additionally, the high costs of agricultural inputs (seeds, fertilizers, and equipment) create obstacles for entrepreneurs to start and expand their agricultural ventures (Ollinaho and Kröger, 2021). Moreover, inappropriate physical infrastructure such as road networks, storage, and processing facilities, as well as poor marketing practices constrain agri-entrepreneurs from market access (Chhabra *et al.*, 2020). Cheng and Adejumo (2021) identified the lack of training and capacity building as an important barrier for agri-entrepreneurs. Furthermore, the lack of social capital such as social networks can make it difficult for entrepreneurs to acquire necessary information, resources, and market access, whereas, sociocultural norms may discourage them from initiating entrepreneurial ventures (Tomlinson *et al.*, 2018). The poor accessibility in rural areas creates significant barriers which complicate the agricultural value chain, and increase production and distribution costs (Pearson *et al.*, 2011). Other entrepreneurial constraints in rural contexts include small local markets, fragmented populations, distant markets, difficult terrain, and inappropriate infrastructure (Levy and Lubell, 2018; Neubauer *et al.*, 2022; Pindado and Sánchez, 2017; Tran and Goto, 2019; Yessoufou *et al.*, 2018). Furthermore, the lack of skilled human resources in rural areas is reported as a barrier to entrepreneurship (Rodríguez-Gutiérrez *et al.*,

2015). A comprehensive and integrated approach is required to address these challenges, promote agri-entrepreneurship, and foster sustainable development.

Recent systematic reviews focusing on agricultural entrepreneurship have explored diverse topics (refer to Table 1). These include antecedents and outcomes of entrepreneurship, entrepreneurship identity, family and institutions (Fitz-Koch *et al.*, 2018), entrepreneurial skills, behavior, approaches, community, and entrepreneurial activity (Dias *et al.*, 2019a). Other areas of investigation encompass entrepreneurial skills, market, and resources (Dias *et al.*, 2019b), and liberalization and sustainability (Condor, 2020) on a global scale.

The existing systematic reviews on agricultural entrepreneurship had diverse focuses and contexts. However, a noticeable gap exists in systematically identifying, categorizing, and prioritizing the challenges and barriers to agri-entrepreneurship, particularly smallholders, as they constitute a major portion of the agricultural communities in the developing world. Moreover, the existing literature on agri-entrepreneurship in developing countries, particularly focusing on smallholders' constraints is often scattered and fragmented, majorly focusing on individual barriers rather than providing a comprehensive understanding of the multifaceted constraints to agri-entrepreneurship. Therefore, this study aims to conduct a systematic literature review to identify, categorize, and prioritize the constraints to agri-entrepreneurship, particularly for smallholders in developing countries.

Consequently, this review outlines the objectives:

- (1) To analyze existing publications (from 2013 to 2023) on barriers to agri-entrepreneurship in developing countries.
- (2) To identify, categorize, and prioritize significant constraints to agri-entrepreneurship, particularly for smallholders in developing countries.

Table 1. Systematic reviews on agricultural entrepreneurship

Author	Research title	Interval	Focus of review	Context
Fitz-Koch <i>et al.</i> (2018)	“Entrepreneurship in the Agricultural Sector: A Literature Review and Future Research Opportunities”	1980–2015	• Antecedents and outcomes of entrepreneurship • Entrepreneurial identity, family entrepreneurship, and institutions	Global
Dias <i>et al.</i> (2019a)	“What’s new in the research on agricultural entrepreneurship?”	2013–2017	• Entrepreneurial Skills and Behavior • Entrepreneurial Approaches, Community and Entrepreneurial Activity	Global
Dias <i>et al.</i> (2019b)	“Agricultural entrepreneurship: Going back to the basics”	Until 2012, VS 2013–2017	• Entrepreneurial Skills • Market and Resources	Global (majorly focus on Europe)
Condor (2020) This review	“Entrepreneurship in agriculture: a literature review” “Agri-Entrepreneurship in Developing Countries – A Systematic Review of Smallholders’ Constraints”	1969–2017 2013–2023	• Liberalization and sustainability • Entrepreneurial constraints for smallholders • Roles and impacts of social networks, i.e. cooperatives	Global Developing Countries
Source(s): Authors’ own work				

- (3) To investigate the roles of social networks i.e. agricultural cooperatives in addressing smallholders' challenges and their impacts on their livelihoods in developing countries.
- (4) To identify research gaps and suggest future directions.

This study addresses the following research questions:

- (1) What are the major constraints for agri-entrepreneurship, particularly for smallholders in developing countries?
- (2) What are the roles of social networks in addressing those challenges and their implications on smallholders' livelihoods in developing countries?

The subsequent sections of this paper follow the following structure: it commences with a description of the methodology, which includes identification, screening, and inclusion of relevant studies. The results section delves into both descriptive and thematic analysis. The concluding segment encapsulates the conclusion, implications, limitations, and prospects for future studies.

2. Methodology

This study utilizes a systematic literature review (SLR) approach ([Tranfield et al., 2003](#)) to explore relevant literature on agri-entrepreneurship ([Dias et al., 2019a](#)), particularly smallholders' constraints in developing countries. The SLR helps examine existing literature by identifying, selecting, assessing, and analyzing retrieved articles ([Rauniyar et al., 2021](#)). It is recognized as an appropriate methodology in the field of entrepreneurship ([Henry et al., 2016](#)). This approach was adopted by various scholars in investigating entrepreneurship in the agriculture sector ([Dias et al., 2019a, b](#); [Fitz-Koch et al., 2018](#)). This SLR followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) 2020 guidelines and standards ([Page et al., 2021](#)).

This review follows the five-phase approach of [Denyer and Tranfield \(2009\)](#), also followed by [Mehmood et al. \(2021\)](#). This approach to conducting the systematic review is illustrated in the following [Figure 1](#).

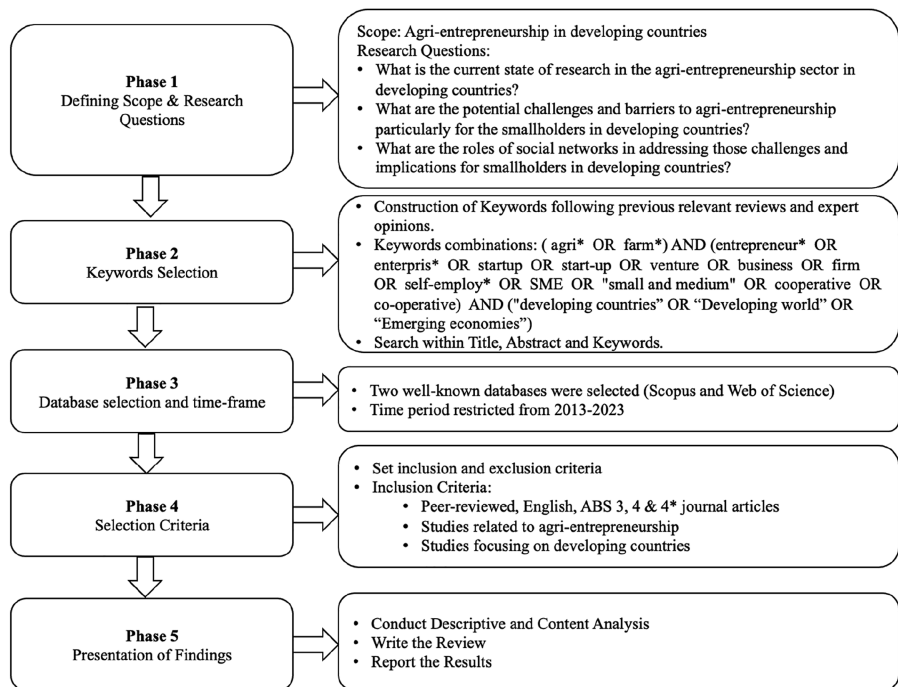
Initially, the objectives of the study were outlined, which include identifying and analyzing existing publications (2013–2023) on agri-entrepreneurship in developing countries, and identifying, categorizing, prioritizing, and analyzing significant constraints to agri-entrepreneurship, particularly for smallholders.

The second step of the process was to find relevant search terms linked to agricultural entrepreneurship in developing countries. To explore the existing literature, we conducted a systematic search following multiple brainstorming sessions with experts and following the systematic reviews conducted by [Dias et al. \(2019a\)](#), and [Fitz-Koch et al. \(2018\)](#) on agricultural entrepreneurship.

In the third phase, the process involved choosing the most pertinent online libraries for conducting article searches, along with specifying the publication period. To maintain the study's quality and reliability, we opted for Scopus and Web of Science databases.

In the fourth phase of this review, inclusion and exclusion criteria were established. A meticulous filtering procedure was implemented to selectively choose the articles. Peer-reviewed articles, English language, ABS 3, 4 and 4* journal articles, relevant to agri-entrepreneurship and a particular focus on developing countries were selected.

The final stage of the review encompasses synthesizing the data, crafting the review, and presenting the results and findings. Both descriptive analysis and content analysis were conducted. The primary focus of the descriptive analysis was to categorize articles based on their publication year, journals, methodologies, and the countries and continents under study. Meanwhile, thematic analysis systematically identified various themes, followed by the



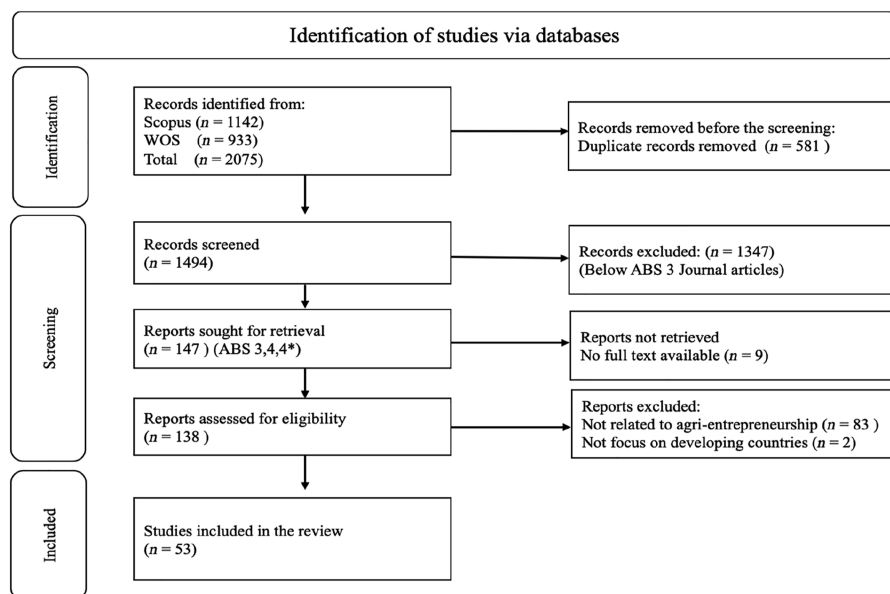
Source(s): Adopted from Denyer and Tranfield (2009) and Mehmood *et al.* (2021)

Figure 1. The five-phase approach of conducting the systematic review

coding process, the approach followed by [Brenya *et al.* \(2023\)](#), [Mehmood *et al.* \(2021\)](#), and [Yu *et al.* \(2023\)](#). The thematic analysis approach, pioneered by [Braun and Clarke \(2006\)](#), has been employed to facilitate the recognition of important themes and patterns within our data and to address pertinent questions ([Gulsia and Yadav, 2023](#)). The content analysis enables a thorough investigation of the information found in the literature already in existence ([Elo and Kyngäs, 2008](#)). As guided by the PRISMA guideline, the process of identification, screening, and selection of studies related to agri-entrepreneurship in developing countries, is illustrated in the following [Figure 2](#), and their explanations of these three steps are given below.

Step1: Identification and Selection of Records

Firstly, the search strategy and protocol were formulated, which were already discussed above. The criterion sampling was used to ensure the inclusion of relevant studies related to agri-entrepreneurship. This approach relies on keyword search and has already been followed by other researchers to conduct systematic reviews on agricultural entrepreneurship ([Dias *et al.*, 2019a, b](#); [Fitz-Koch *et al.*, 2018](#)). A wide range of search terms were utilized to search existing studies on agri-entrepreneurship in developing countries. The main keywords such as “agri*” OR “farm*” AND “entrepreneur*” were derived from the SLRs of [Dias *et al.* \(2019a\)](#) and [Fitz-Koch *et al.* \(2018\)](#). The complete set of keywords includes (Agri*, farm*) AND (Entrepreneur*, Enterpris*, Startup, Start-up, venture, Business, Firm, Self-employ*, SME, Small and Medium*, Cooperative, Co-operative) AND (Developing Countries, Developing World and Emerging Economies). Two reputable databases such as Scopus and Web of Science were selected to retrieve relevant records. These databases are recognized for their comprehensive collection of peer-reviewed literature on agribusiness ([Singh *et al.*, 2021](#)).



Source(s): Adopted from Page *et al.* (2021)

Figure 2. PRISMA flow chart for systematic review

These databases were commonly used by scholars as a resource in number of reviews review studies and bibliographic analyses, particularly related to agricultural entrepreneurship (Baier-Fuentes *et al.*, 2019; Dias *et al.*, 2019a; Fitz-Koch *et al.*, 2018). The SLR was carried out in August 2023, and the final search was performed on December 16, 2023, to update the list. The keywords were searched by selecting title, abstract, and keyword. Boolean operators “OR” and “AND” were used to find a substantial number of relevant articles. 4,379 articles were found based on the initial search, later applying inclusion criteria, i.e. only English-language journal articles, time frame from 2013 to 2023, reduced the search results to 2,075 articles.

Step2: Screening of Records

After an initial screening of records in the databases, the results were exported to the Zotero software (a reference management tool), where 581 duplicate entries were detected and removed. To ensure quality assessment the remaining 1,494 records were exported to MS Excel and applied ABS ranking. Those articles published in ABS 3, 4, and 4* ranked journals were selected, and 1,347 records were removed due to the lower quality of publications. Further, 9 articles were removed due to non-full text availability. In the next step, 138 articles were selected as eligible for review. These articles were analyzed through reading titles, abstracts, keywords, and full articles. 83 articles were removed due to lack of relevancy to the topic and research questions, as those articles were not related to agricultural entrepreneurship, and a further two articles were also removed as they were not related to developing countries. Finally, 53 articles were selected for the review.

Step3: Inclusion of studies

After applying inclusion and exclusion criteria, finally, 53 articles were selected for final review. These articles were thoroughly examined to seek answers to the research questions. Descriptive and content analyses were conducted. The content analysis facilitated to identify

various barriers to agri-entrepreneurship. Initially, first-order codes were generated after examining the studies and second-order themes were created from those codes. The thematic analysis helped create different themes from the data.

3. Data analysis and results

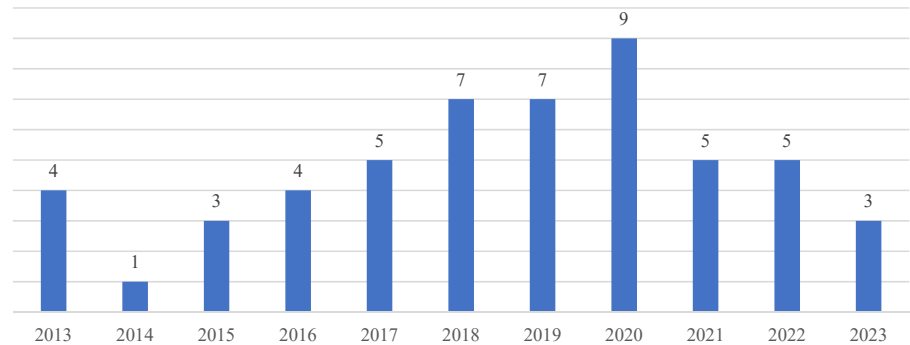
3.1 Descriptive analysis

3.1.1 Yearly distribution of publications. To analyze the development of research in agri-entrepreneurship within the context of developing countries and gain insights into prevailing trends, a total of 51 articles were selected for examination. The selected publications were categorized by their year of publication, as depicted in Figure 3. While 2013 marked the initial year of publication, there was a substantial surge in academic works between 2017 and 2020, surpassing the figures from the early years. This trend underscores a growing interest in agri-entrepreneurship research particularly in African countries.

3.1.2 Publications by geographic regions. Figure 4 shows the geographical distribution of articles across different countries. The research’s country was determined based on the targeted study countries. It shows that there are notable contributions from various countries, especially from Ethiopia, Uganda, China, and India. The two African countries Ethiopia and Uganda both have 12 articles to their name, with two Asian countries including China and India following closely with 4 articles each. Vietnam has 3 and Peru, Ghana, Kenya, and Nepal account for 2 articles each. Other countries, including Zambia, Rwanda, Senegal, Nicaragua, Tanzania, Nigeria, Cote d’Ivoire, Chad, Benin, and Malawi have a contribution of 1 article each.

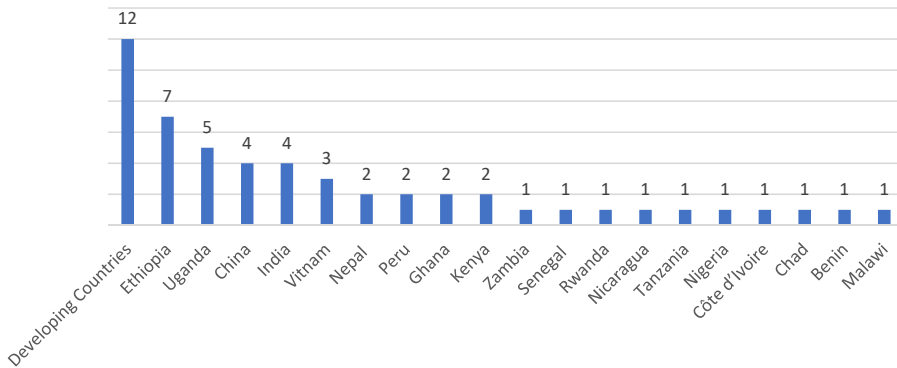
Figure 5 shows the distribution of publications on a continental scale. The data reveals that Africa has significant contribution with 25 articles (47% of the selected articles for review), while less work has been conducted in Asia, South and North America. Asia has a contribution of 13 articles (24% of the works), those articles with a general focus on developing countries, without targeting a specific country, have 23% share with 12 articles, whereas, South America and North America, have made smaller contributions, representing 4%, and 2% of the overall works, respectively, in comparison to other continents.

3.1.3 Journal-wise distribution of articles. Table 2 presents the allocation of publications among different scientific journals. The data reveals that Food Policy, a journal ranked ABS 3, has published the highest quantity of articles, closely followed by World Development and Journal of Rural Studies, both of which are also ABS 3-ranked journals. A total of 19 journals have featured a variety of articles related to agri-entrepreneurship in developing economies, underscoring the diversity of literature within the field.



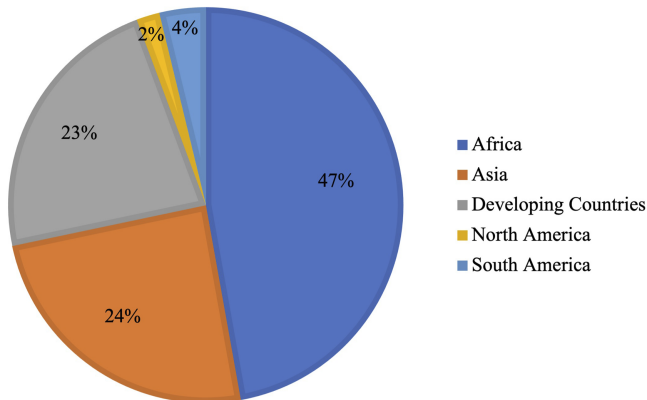
Source(s): Authors’ own work

Figure 3. Yearly distribution of articles



Source(s): Authors' own work

Figure 4. Geographic distribution of articles



Source(s): Authors' own work

Figure 5. Distribution of publications by continents

3.1.4 Distribution of publications by research methods. As depicted in Figure 6, the distribution of publications selected for review reveals that 32 articles out of 53 (60%) are quantitative studies, while 9 articles (17%) are qualitative, and the remaining 8 articles (15%) have employed a mixed-method approach and 2 articles (3%) studies are review articles and conceptual respectively.

3.2 Thematic analysis

In our literature analysis, we employed an inductive qualitative content analysis methodology to uncover challenges and obstacles associated with agri-entrepreneurship. The thematic analysis approach was used to systematically find various themes in the agri-entrepreneurship literature, and this approach, as employed by [Mehmood et al., \(2021\)](#), [Brenya et al. \(2023\)](#), and [Yu et al. \(2023\)](#), was followed by the coding process. The thematic analysis method, first introduced by [Braun and Clarke \(2006\)](#), was utilized to facilitate the recognition of significant themes and patterns in our dataset and to address significant questions, as described by [Gulsia and Yadav \(2023\)](#).

Table 2. Journal-wise distribution of publications

Journals	No of articles
Food Policy	13
Journal of Rural Studies	10
World Development	8
Production and Operations Management	2
Journal of Agricultural Economics	2
World Bank Economic Review	2
Journal of Development Studies	2
Journal of Business Research	2
Journal of Development Economics	2
Technological Forecasting and Social Change	1
International Journal of Production Research	1
Annals of Operations Research	1
International Journal of Entrepreneurial Behaviour and Research	1
Quarterly Journal of Economics	1
International Journal of Production Economics	1
Entrepreneurship and Regional Development	1
Journal of Small Business Management	1
American Journal of Agricultural Economics	1
Management Science	1
Total	53

Source(s): Authors' own work

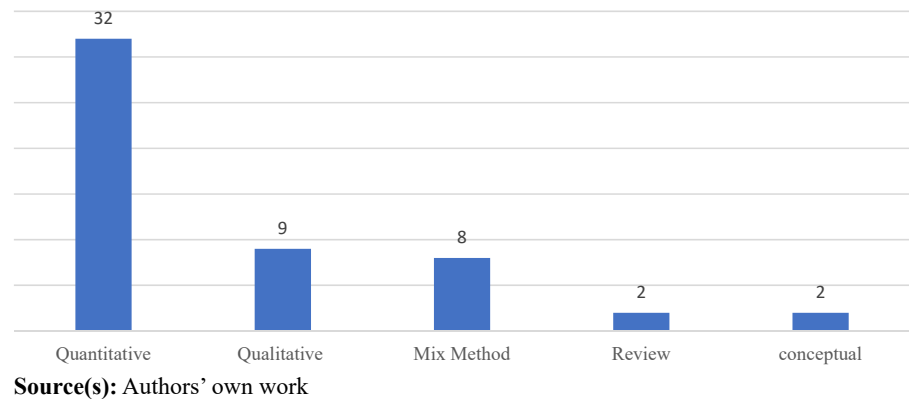
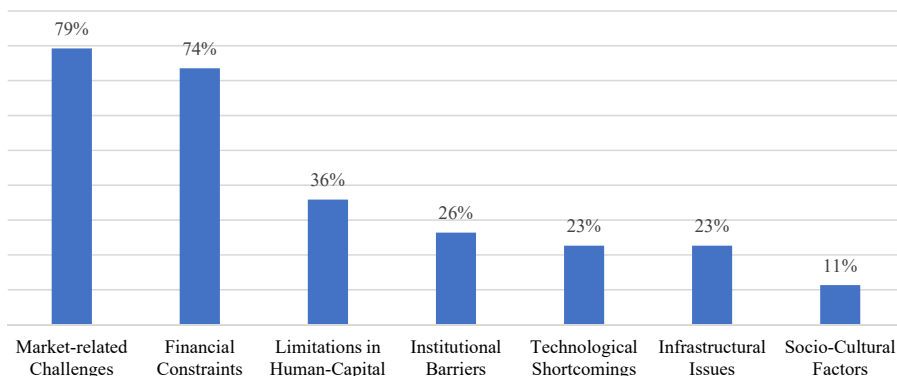


Figure 6. Distribution of publications by research methods

The challenges and barriers are categorized into thematic groupings according to their similarities and significance. The thematic categories of challenges to agri-entrepreneurship include market-related challenges, financial constraints, limitations in human capital, technological shortcomings, institutional barriers, infrastructure issues, and socio-cultural factors. The following [Figure 7](#) shows that 79% of the articles reported market-related challenges, 74% of the articles revealed financial constraints, 36% highlighted limitations in human capital, 26% reported institutional barriers, 23% mentioned technological shortcomings, 23% infrastructural issues, and 11% highlighted socio-cultural factors.

3.2.1 Market-related challenges. In developing countries, agri-entrepreneurs, particularly smallholders, face numerous market-related constraints that prevent them from fully reaping



Source(s): Authors' own work

Figure 7. Classification and ranking of challenges to agri-entrepreneurship in developing countries

the benefits of market participation. A significant challenge for these smallholders is limited access to markets, as highlighted by various studies (Neubauer *et al.*, 2022; Saridakis *et al.*, 2021; Serra and Davidson, 2021). This constraint is further exacerbated by information asymmetry, which smallholders experience concerning real-time market information, such as market price, market demand, and product quality requirements (Gelo *et al.*, 2020). The lack of such information can impede their ability to make informed decisions about production and marketing, such as crop selection, sales timing, and quality assurance (Hu *et al.*, 2019; Liao and Chen, 2017). In addition, the higher transaction costs and lower bargaining power create difficulties for smallholders in accessing potential markets (Aflagah *et al.*, 2022; Leng, 2022; Saridakis *et al.*, 2021; Tefera *et al.*, 2020). The smallholding and lower productivity create limited economies of scale which lead to reduce bargaining power of smallholders in high-value markets (Abdul-Rahaman and Abdulai, 2018). Consequently, smallholders have to rely on middlemen to market their produce (Abebe *et al.*, 2016; Pant, 2016), and those intermediaries often take a higher share of the market price (Abebe *et al.*, 2016). In addition, smallholders face market risks and uncertainties arising from perishable goods and seasonal harvesting (Abebe *et al.*, 2013; Ruml and Qaim, 2020). Maintaining product quality and safety is also a significant problem for smallholders in developing countries (Hoffmann and Jones, 2021; Tefera *et al.*, 2020). The poor product quality and safety are often associated with inadequate postharvest practices, low-quality inputs, inefficient quality certification systems, and ineffective regulations (Hoffmann and Jones, 2021). It will lead to higher risks as they often face rejection in high-value markets due to poor product quality (Ola and Menapace, 2020). Moreover, stringent quality and safety standards in high-value markets may present export barriers from developing countries (Fernandes *et al.*, 2019). Furthermore, other barriers also create obstacles for smallholders in developing countries, particularly in rural areas, such as fragmented value chains (Tefera *et al.*, 2020), distant markets (Dias *et al.*, 2019a; Hoffmann and Jones, 2021; Orsi *et al.*, 2017), and inappropriate infrastructure (Abebe *et al.*, 2016) leading to increased transaction costs and limited market access (Mojo *et al.*, 2017).

3.2.2 Financial constraints. The lack of financial resources is considered one of the major barriers to entrepreneurs, particularly for smallholders in developing countries. One of the primary challenges is the lack of access to credit and financial services, which makes it difficult for smallholders to make investments in agricultural activities such as improving farming techniques, acquiring quality inputs, and expanding their agricultural and entrepreneurial enterprises (Sandhu and Hussain, 2020; Zhou *et al.*, 2021; Ksoll *et al.*, 2016). The high interest rates and stringent collateral requirements for obtaining loans from

financial institutions often create barriers to arranging essential capital for their agricultural and entrepreneurial endeavors (Zhou *et al.*, 2021; Sandhu and Hussain, 2020). Additionally, low-resource farmers have limited access to institutional financing because they are discriminated by commercial banks due to lending risks (Birthal *et al.*, 2017). Moreover, the higher transaction costs often limit their market access (Gelo *et al.*, 2020; Leng, 2022), thus compelling them to sell their produce to middlemen at lower prices (Tefera *et al.*, 2020; Abebe *et al.*, 2016). Furthermore, the lack of financial resources makes it very challenging for them to make investments in transportation, storage facilities, access to information, and other crucial infrastructure (Neubauer *et al.*, 2022).

3.2.3 Limitations in human capital. In developing countries, smallholders face a variety of human-capital-related challenges. They often lack essential technical and entrepreneurial knowledge and skills, which significantly affect their agricultural and entrepreneurial activities (D'Exelle and Verschoor, 2023; Mojo *et al.*, 2017; Sandhu and Hussain, 2020). They have limited opportunities for training and skill development, particularly in improved farming techniques, quality control, postharvest management, market linkages, market research, and export procedures (Gelo *et al.*, 2020; Orsi *et al.*, 2017). The limited capacities and skills of farmers and their cooperatives often result in poor product quality and safety (Zhou *et al.*, 2019; Fernandes *et al.*, 2019). Therefore, it is imperative to improve the entrepreneurial skills of smallholders, as their improved entrepreneurial competencies could lead to the development of agricultural entrepreneurship and increase employment opportunities. This can be achieved by improving entrepreneurial education and training (Sandhu and Hussain, 2020).

3.2.4 Institutional barriers. Smallholders face several institutional constraints in developing countries, particularly inadequate government assistance and the incapacity of government institutions to provide better services (Luo *et al.*, 2017; Paul *et al.*, 2016; Yessoufou *et al.*, 2018). In addition, the absence of extension services and lack of cooperation with farmers and cooperatives impede their access to vital information, knowledge, and technology (Abdul-Rahaman and Abdulai, 2018; Birthal *et al.*, 2017; Luo *et al.*, 2017). Moreover, the absence of effective regulatory authorities, as well as effective quality control systems results in poor product quality and safety, leading to market failure (Hoffmann and Jones, 2021; Mancini, 2013). The stringent quality and safety standards in formal channels constrain smallholder from accessing high-value markets, thus they often sell their produce through informal channels, negatively impacting their productivity, profitability, and operation efficiency (Vandeplass *et al.*, 2013). The fragmented value chains result in substantial postharvest losses of their agricultural produce (Asian *et al.*, 2019). Additionally, inadequate risk management mechanisms and lack of professional support often result in low technology adoption by smallholders in their agricultural operations (Abate *et al.*, 2016; Doanh *et al.*, 2022). Furthermore, corruption and malpractices in developing countries create barriers for smallholders in starting their entrepreneurial ventures, and this situation is further exacerbated by the weak legal framework that fails to protect their interest (Sandhu and Hussain, 2020).

3.2.5 Socio-cultural factors. A variety of sociocultural factors constrain the agricultural and entrepreneurial activities of smallholders in developing countries, particularly gender discrimination. Women in developing countries face gender-based constraints and cultural norms that limit their access to crucial resources and opportunities, thus limiting their participation in productive endeavors (Meemken and Qaim, 2018). They have relatively little control over key factors of production such as land, labor, and capital and are predominantly dominated by men (Serra and Davidson, 2021). Women also have challenges related to education, skill development, access to agricultural and financial services, and sociocultural norms, that prevent them from adopting agricultural technology, which lowers yield and their market access (Burchardi *et al.*, 2019; Doanh *et al.*, 2022; Meemken and Qaim, 2018; Sandhu and Hussain, 2020; Serra and Davidson, 2021). Sandhu and Hussain (2020) underscored that Indian farmers grapple with land fragmentation issues stemming from population growth and

the division of land among family members through inheritance. Furthermore, the migration of educated youth to urban areas and overseas in pursuit of improved opportunities exacerbates the challenges, leaving less-educated and low-skilled individuals to remain in rural areas, often engaged in agricultural work (Sandhu and Hussain, 2020).

3.2.6 Technological shortcomings. In developing countries, smallholders face a variety of challenges due to a lack of access to and low adoption of modern technology, including lower productivity, inefficiency, poor product quality and safety, and limited market access (Leng, 2022; Ruml and Qaim, 2020; Venot, 2016). Smallholders in developing countries have lower adoption of modern technology, for example, in their study on Ethiopian smallholders Abate *et al.* (2016) revealed that the utilization of modern technology such as improved inputs such as seeds, fertilizers, and pesticides is very low compared to the recommended standards. The lack of access to modern technology and poor postharvest practices could lead to substantial postharvest losses and poor product quality and safety (Hoffmann and Jones, 2021). Furthermore, Ferro *et al.* (2015) claimed that farmers in developing countries lack access to modern technology to meet the quality and safety standards of high-value markets. Sandhu and Hussain (2020) assert that a lack of financial resources often constrain smallholders from adopting modern technology, thus limiting their productivity and growth.

3.2.7 Infrastructural issues. In developing countries, smallholders face various infrastructural issues, hampering their agricultural and entrepreneurial activities. These challenges include inadequate road networks, poor transportation, shortage of power supplies, and unreliable telecommunication systems (Doanh *et al.*, 2022; Gelo *et al.*, 2020; Yessoufou *et al.*, 2018). The infrastructural issues and their impacts are more severe in rural areas because of their fragmented places, dispersed population, rugged landscapes, and remoteness from markets (Neubauer *et al.*, 2022; Tran and Goto, 2019; Yessoufou *et al.*, 2018). Moreover, the lack of processing and storage facilities aggravates the situation of smallholders by resulting in high postharvest losses, poor product quality and safety, and limited market accessibility (Abebe *et al.*, 2013; Adhvaryu *et al.*, 2021; Hoffmann and Jones, 2021).

3.2.8 Thematic relationships and regional comparisons. This review revealed a range of constraints faced by smallholders in developing countries, which are classified into several themes. Most of them are interconnected, so considering addressing those individual barriers may not be sufficient, whereas an integrated and comprehensive approach is required to address smallholders' constraints.

The financial constraints are linked to several other constraints such as market-related challenges, infrastructural issues, and technological limitations. For example, lack of financial resources hinders entrepreneurs from making investments in market research, product development, and promotional activities. Similarly, it restricts their investments in transportation, storage, and processing facilities, access to information, and other essential infrastructure (Neubauer *et al.*, 2022). Moreover, limited access to finance impedes technology adoption among smallholders, constraining their productivity and growth (Sandhu and Hussain, 2020). On the contrary, the financial constraints are caused by institutional challenges, such as bureaucratic hurdles, weak regulatory frameworks, and corruption. Moreover, high interest rates and stringent collateral requirements for getting credits from financial institutions create hurdles in securing finance for their agricultural and entrepreneurial pursuits (Sandhu and Hussain, 2020; Zhou *et al.*, 2021).

One of the most crucial challenges for the smallholders is the market-related challenges, which are exacerbated by other factors such as geo-infrastructural issues, technological constraints, institutional hurdles, and human capital limitations. For example, geo-infrastructural issues such as remoteness from the market, poor physical infrastructure, and lack of storage and processing facilities lead to increased transaction costs, postharvest losses, and poor product quality and safety, thus limiting their market access (Gelo *et al.*, 2020; Hoffmann and Jones, 2021; Leng, 2022). The lack of technological resources such as modern machinery, improved inputs, and methods results in substandard products leading to market failure (Zhou *et al.*, 2019). In addition, inappropriate telecommunication and Internet services

hinder smallholders from adopting modern technology to expand their market outreach (Doanh *et al.*, 2022). Furthermore, the absence of effective regulatory authorities and quality control mechanisms results in poor product quality and safety, restricting their access to high-value markets (Hoffmann and Jones, 2021).

The human capital challenges are linked to technological limitations and institutional constraints. For example, a lack of appropriate technical and entrepreneurial skills, education, mentoring, and training limits innovation and the adoption of modern technology in agricultural operations by smallholders (Doanh *et al.*, 2022). Conversely, the technological constraints are exacerbated by inadequate infrastructure such as transportation, electricity, and Internet connectivity.

Institutional constraints can arise from formal institutions such as laws, policies, and regulations, as well as informal institutions such as cultural norms, traditions, and social expectations. There are deep connections between formal and informal institutions. Sociocultural factors such as gender norms, cultural biases, and societal attitudes often limit access to essential resources and opportunities for specific groups. Institutional policies may fail to address those sociocultural biases. For example, where gender discrimination is prevalent, the institutional policies may fail to provide equal opportunities. Additionally, sociocultural norms may impact how institutions prioritize resource allocation, governance, and policymaking, potentially discriminating against certain groups.

Regional Comparisons: Comparison of challenges to agri-entrepreneurship across developing regions – Africa, Asia, and Latin America - reveals some common and region-specific constraints. Studies conducted in Latin America focused on improving market access through Geographic Indication (GI) and reported different barriers such as a lack of awareness and understanding of GI schemes, technical issues related to production methods, and the absence of a quality control system (Mancini, 2013). Moreover, the export/trade barriers were highlighted such as stringent quality and sustainability standards restricting smallholders from accessing high-value markets (Curzi *et al.*, 2020; Schuster and Maertens, 2013).

However, in Asia and Africa, the findings are almost similar. Market-related barriers were cited highest in Asia following the financial constraints, whereas financial constraints were reported highest in Africa following the market-related barriers. Other factors include human capital limitations, institutional factors, infrastructural issues, technological limitations, and sociocultural constraints are reported in both regions. Studies conducted in Africa have a major focus on social networks (cooperatives), contract farming, and access to finance. Whereas Asian studies have a major focus on access to finance (crowdfunding, microcredits), technology adoption, and value chain upgradation.

3.3 Roles and impacts of social networks

In developing countries, smallholders face numerous challenges in production and marketing impacting their agricultural and entrepreneurial activities. Social networks such as cooperatives could be a transformative solution for smallholders' constraints. Cooperatives provide essential support to members by granting access to resources such as inputs, credits, information, training, physical infrastructure, and market access (Abdul-Rahaman and Abdulai, 2018). Orsi *et al.* (2017) affirm that the production assistance offered by farmers' cooperatives, i.e. inputs and storage facilities, correlates positively and significantly with the improvement in farmers' performance. Cooperatives act as centers for knowledge exchange, learning, and collaborative problem-solving, effectively addressing information and skill gaps among smallholder farmers (Abdul-Rahaman and Abdulai, 2018). Agricultural cooperatives are increasingly utilized in developing countries to encourage advanced agricultural technologies. A study conducted by Manda *et al.* (2020) indicates that cooperative membership not only increases the adoption of technology but also accelerates the adoption process. Furthermore, cooperatives contribute to enhancing product quality and safety standards by implementing various quality assurance measures and practices (Zhou *et al.*,

2019). Networks offering information and support significantly influence farmers' decisions to adopt new crops or improved seeds (D'Exelle and Verschoor, 2023). The establishment of Village Savings and Loans Associations as microfinance institutions can positively impact farmers' welfare and economic activities by providing savings and credit opportunities in peripheral regions of developing countries (Ksoll *et al.*, 2016). However, challenges arise in the distribution of agricultural inputs through farmer groups, revealing instances of elite capture where those connected to the group leader receive more benefits compared to non-connected farmers (Liverpool-Tasie, 2014). Additionally, farmers' cooperatives serve as a strategic mechanism for overcoming challenges posed by market imperfections and institutional constraints. Through collective sales and marketing strategies, cooperatives create economies of scale, enhancing bargaining power and securing higher prices for farmers' produce (Abdul-Rahaman and Abdulai, 2018). Cooperatives also streamline market participation, reducing transaction costs, eliminating middlemen, and making commercial activities more accessible for smallholder farmers (Abebe *et al.*, 2016; Gelo *et al.*, 2020).

The current body of literature underscores the positive and substantial impacts of social networks like cooperatives, farmers' organizations, and associations on farmers' welfare. Studies by Mojo *et al.* (2017) and Asian *et al.* (2019) highlight the significant positive effects of cooperative membership on income and assets, with members earning notably more than non-members. Abdul-Rahaman and Abdulai (2018) unveil that engagement in farmer associations is linked with enhanced yields and operational effectiveness among smallholders. Serra and Davidson (2021) measuring the impact of cooperatives on women in Ethiopia, found that membership significantly positively affects market prices and production quantities. Furthermore, studies suggested that the negative impacts of stringent food standards on exports from developing countries can be mitigated through networks, collaborations, and coordination of farmers, exporters, and governments (Curzi *et al.*, 2020; Fernandes *et al.*, 2019; Ferro *et al.*, 2015). The existing works of literature affirm that farmers' cooperatives support farmers in access to resources and markets, with significant positive impacts on their livelihoods in developing countries.

4. Conclusion and implications

In developing nations, where agriculture holds a crucial position in the economy, agri-entrepreneurship emerges as a dynamic force with the potential to propel economic growth, foster rural development, and address issues especially poverty, and food insecurity. Despite its transformative potential, the agricultural sector in developing countries grapples with various challenges that negatively impact the well-being of its communities.

This study sheds light on significant impediments to agri-entrepreneurship, particularly affecting smallholder farmers in developing countries. These challenges were discerned through a systematic review and systematically categorized using thematic analysis. The study identified several constraints and categorized them into market-related challenges, financial constraints, limitations in human capital, institutional barriers, sociocultural factors, technological shortcomings, and infrastructural issues.

This review has theoretical and policy implications for various stakeholders by systematically identifying, classifying, and prioritizing major constraints faced by smallholders in developing nations. It contributes to the discourse on agricultural entrepreneurship, particularly focusing on smallholders in developing countries. The study lays the foundation for the development of targeted measures to address the challenges confronting smallholder farmers in developing nations. To effectively address these challenges, policymakers, researchers, and practitioners need to devise and implement innovative strategies and policies, with a particular focus on fostering agri-entrepreneurship, promoting inclusive and sustainable agricultural practices, and improving access to resources and markets, thereby improving the overall livelihoods of agricultural communities in developing countries.

5. Limitations and future directions

This review acknowledges various limitations, such as those related to the choice of language, date of publication, standards of quality, and the context of the study. The research only selected peer-reviewed articles in English, excluding non-English sources as well as books, book chapters, and conference proceedings. It is acknowledged that research conducted in other languages and other sources might have provided insightful information about agri-entrepreneurship. By excluding non-English sources, the review might have missed key findings, especially in regions where research is predominantly published in local languages. This could lead to a geographical and cultural bias in the study's results. This limitation is justified by the practical difficulties associated with translating and comprehending non-English articles. Therefore, future studies could address this limitation by incorporating multilingual sources and collaborating with experts in other languages to ensure a more inclusive and comprehensive review.

The selection of the timeline from 2013 to 2023 resulted in the exclusion of studies conducted before this period. The last decade was selected as a timeframe for this SLR because in this period many transformative global and regional initiatives targeting poverty, unemployment, and food insecurity and their alignment with agriculture and rural development, became prominent in developing countries, particularly the UN Sustainable Development Goals (2015), the African Union's Malabo Declaration (2014), and China's Targeted Poverty Alleviation Program (Zhou *et al.*, 2023), etc.

The review only considered ABS 3, 4, and 4* ranked journal articles to ensure the quality of chosen articles, effectively filtering out studies published in lower-ranked journals that may lack academic rigor. The ABS-ranked journals are recognized for their rigorous peer-reviewed process, adherence to high academic standards, and significant theoretical and practical contributions. It strengthens the credibility of the review, and the users can have greater confidence in its findings due to high-quality sources. Furthermore, the research was limited to developing countries, which resulted in the removal of studies conducted in developed countries. A suggestion for future researchers is to employ a systematic review approach, comparing agri-entrepreneurship in developed and developing countries.

Despite these acknowledged limitations, our findings actively contribute to improving understanding of agri-entrepreneurship research in developing countries, particularly focusing on smallholders. The review utilized thematic analysis as a research approach, providing a holistic picture of constraints to agri-entrepreneurship in developing countries and highlighting potential future research avenues in agri-entrepreneurship for scholars to explore.

In the current review of agri-entrepreneurship in developing countries, a geographical bias is evident, with a predominant focus on African countries (47%), while Asian countries (24%) and others are underrepresented. Moreover, the review reveals a dominance of quantitative studies (60%). Furthermore, the existing literature focuses mainly on individual barriers. Therefore, this review calls for in-depth qualitative studies (i.e. ethnographic, case studies) and mixed-method approaches (i.e. surveys, interviews, observations, and focus group discussions), particularly focusing on the multifaceted challenges for smallholders in developing countries. Future research directions on agri-entrepreneurship in developing countries might include technology interventions and digital solutions, the role of social capital and networks, climate change and sustainability, and gender aspects.

Future studies could look into how emerging technologies, i.e. precision farming and mobile solutions can help overcome barriers such as access to information, finance, and the market. For instance, research carried out in China illustrated the potential benefits of the technological revolution in slashing transaction costs and information asymmetry, thereby motivating farmers to engage in commercial activities (Leng, 2022). Future research could look at individual case studies where technology adoption reduced entrepreneurial constraints.

Another future direction could be exploring the roles of social networks, i.e. cooperatives in addressing smallholders' constraints. Numerous studies highlight the benefits of cooperative

membership for smallholders (Abdul-Rahaman and Abdulai, 2018; Asian *et al.*, 2019; Serra and Davidson, 2021). This study emphasizes the need for more research on how social capital and community-based networks can result in collective solutions to entrepreneurial challenges in different contexts. Conversely, certain studies highlight challenges within farmers' organizations, such as elite capture and intra-group dynamics affecting equal access to resources and opportunities (Liverpool-Tasie, 2014). Strategies to address those challenges within cooperatives should be investigated.

Promoting sustainable agri-entrepreneurship emerges as another future direction, considering increasing concerns about environmental degradation, climate change, and food safety. Future studies could focus on developing resilient agricultural models, and entrepreneurial strategies that address environmental sustainability could provide crucial guidance for policy and practice. Future studies also need to focus on gender aspects in agri-entrepreneurship in developing countries, particularly focusing on gender-specific barriers and strategies to promote inclusive agri-entrepreneurship.

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