

The Role of Financial Literacy on Investment Decisions in Supporting Agricultural Development: What is the Future Agenda?

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Financial literacy is recognized as a useful tool for making financial decisions. The better a person's literacy, the better their financial management including in making investment decisions, including farmers. This study aims to uncover a future agenda to investigate the role of financial literacy in shaping investment decisions for farmers which is very useful in business development and agricultural development in general. The next goal is to present empirical evidence as an agenda for further investigation into human resource management practices. They use a literature review study approach with a systematic review paradigm. Involving around 38 major journals that discuss financial literacy and investment decisions in the agricultural sector, supported by other journals that discuss resource management practices. The analysis results show that the study analyzes the role of financial literacy in shaping investment decisions for farmers and agricultural development in 16 countries, spread across Asia, Africa, and Europe. The agenda for discussing future research that interests researchers is focused on four things. First, factors that influence/drive investment decisions. Second, factors that shape financial literacy in agricultural business development. Third, household finances. Fourth, is the level of financial literacy. Specifically, human resource management practices that need to be further proven are regarding financial literacy, cognitive bias, and emotional bias in reflecting investment decision-making. Theoretical implications are that financial literacy has been proven to contribute to shaping the knowledge of the community (farmers and business actors) when making investment decisions. To strengthen this, further evidence is needed, along with factors that influence (including barriers) financial literacy. Farmer households are the most frequently suggested subjects. Practical implications are that the Government and other parties involved in financing agricultural businesses must participate in providing scenarios and infrastructure (technology and innovation) to support financial literacy for farmers and the general public.

Keywords: Financial literacy, decision making, investment, farmers, farmer household, human resource management, review, future agenda.

INTRODUCTION

Financial literacy was introduced in the 19th century, but it was not as popular as it is today. Financial literacy did not yet have a place in formal education at the time. However, money management was as important as it is today, and records show early attempts at financial education. One example from this period comes from the United States by James Gilbert, a manager for the London and County Bank. Quoted from Chhillar and Arora (2023); Odlyzko (2016), James Gilbert worked part-time as a personal finance writer, and in 1849, Gilbert published an article titled "Ten Minutes' Advice on Maintaining a Banker's Possession." In it, Gilbert detailed the benefits of opening a bank account and explained the

process for those who might be intimidated by it. Entering the 20th century, financial literacy was first taught officially. In America, a law that had a significant impact on financial literacy education, known as the Smith-Lever Act of 1914, was passed. This law created university programs that conducted research and taught the public "useful and practical information" on a variety of topics, including personal finance (Odlyzko, 2016).

Quoted by Adil *et al.* (2022); Kanagasabai and Aggarwal (2020); Putri and Hikmah (2020); Rosdiana (2020), conceptually financial literacy is defined as the ability to make the right judgments to make effective decisions regarding the use and management of money. Likewise, Novianggie and Asandimitra (2019); Hunjra and Rehman

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(2016) reported that financial literacy is a useful tool for making the right financial decisions. Based on this view, financial literacy is a means to accelerate a person's financial well-being, including farmers.

The concept of financial literacy will be very useful when faced with empirical facts about economic turmoil for entrepreneurs. At the same time, global climate change is also an economic problem, especially for farmers who are very vulnerable to climate. In such conditions, investment is the best way to prepare for a future where the world will continue to experience unexpected changes, namely by investing. Investment is a reflection of the ability to make decisions.

A person who has good financial literacy will tend to choose investments with high risks and greater profits, this is driven by their high financial knowledge so that they know more and can minimize the risks that will be faced. This theory has been proven by researchers Adil *et al.* (2022); Kanagasabai and Aggarwal (2020); Putri and Hikmah (2020); Rosdiana (2020) that financial literacy has a good influence in shaping investment decision-making. In different cases, it seems that financial literacy is not always able to explain its role in decision-making. This argument arises based on the findings of Chofifah *et al.* (2023); Yuliani and Nurwulandari (2023) that financial literacy does not have a significant effect on investment decisions. This fact shows that there is still a theoretical gap, thus opening up new space for further research.

In the agricultural sector, Aidoo-Mensah *et al.* (2022); Sasmita *et al.* (2022); Safitri, (2021) reported that financial literacy is still relatively low and needs to be improved because it also has an impact on low income levels. Benedict *et al.* (2024) continued that financial literacy is important today, because the investment world is currently booming in the agricultural sector. If farmers' financial literacy is low, they will lose opportunities in business development.

The role of financial literacy in agricultural investment has also attracted the attention of researchers. This is quite following the theory and empirical evidence reviewed as reported by Liu *et al.* (2024); Benedict *et al.* (2024); Akber *et al.* (2024); Khairunnisa *et al.* (2024); Obi-Anike *et al.* (2023); Xu *et al.* (2023); Akande *et al.* (2023); Bradfield *et al.* (2023); Taramuel-Taramuel *et al.* (2023); Labojova *et al.* (2022). It's just that their research objectives have not been revealed and lead to the role of financial literacy in providing an effect on shaping behavior in farmers' decision-making in investing. On this basis, a study is needed to reveal the future agenda that needs to be carried out so that the research position is stronger and more relevant in the current context.

The purpose of this study is to reveal the future agenda as a roadmap in studying the role of financial literacy in the formation of investment decisions for farmers for business development and agricultural development in general. The roadmap in question is also compiled based on the mapping of the role of financial literacy on investment decisions in

human resource management practices. That way, the expected results are stronger and at the same time become the choice of study objects so that research findings can be constructed in broader practices.

MATERIALS AND METHODS

To reveal the role of financial literacy on investment decisions in supporting agricultural development using a literature study research approach. Quoted from Lame (2019); Cash (2018); Sio *et al.* (2015); Lewin, (2008); Francis and Baldesari (2006) literature study research is used to analyze in the form of criticism, review, find theories, and empirical facts, and construct concepts from a topic.

Francis and Baldesari (2006) stated that the commonly used literature study research is a systematic review with a meta-synthesis model. In this case, choosing a systematic review approach. According to Lame (2019); Cash (2018); Sio *et al.* (2015) a systematic review is a research technique to identify, evaluate, and interpret all research results on topics or phenomena that are of concern to researchers that require further study. In terms of determining the topic of study, it is generally based on the researcher's subjective view of the phenomena experienced which is supported by mapping the gap or conflict between theory and empirical facts.

The implementation stage of a systematic review refers to the steps mentioned by Francis and Baldesari (2006) and supported by several experts such as Snyder (2019); Palmatier *et al.* (2018); Jahan *et al.* (2016); Boyd and Solarino, (2016); Rodell *et al.* (2016); Carlborg *et al.* (2014). The stages in question are: 1) identification of developing topics or empirical facts that are being studied by researchers; 2) searching relevant literature; 3) selection of relevant and quality research results; 4) extraction and citation of research results; and 5) Presentation of research results in a research report.

Topic Identification: Topic identification is based on the results of the researcher's review of various sources that are considered to still have a gap between theory and empirical facts. The results of the researcher's review are then focused on "the role of financial literacy on investment decisions in supporting agricultural development".

Literature Search: Searching for relevant literature according to the specified topic. To facilitate filtering and consistency of search topics, the search is only on research published in the form of international scientific journals. The technique of searching for journal literature by determining the search "keywords". There are four journal search keywords used, namely:

- a) Financial literacy for farmers,
- b) Financial literacy towards farmer investment decisions,
- c) Financial literacy towards business development and agricultural development, and
- d) Farmer investment decisions.



Selection of Quality Research Results: The results of the journal search are based on the keywords mentioned above, then a selection to determine the journal that is appropriate to the topic and the latest. The criteria for selecting research results: a) Literature only in the form of international journals; b) International journals with a reputation for Scopus index; c) International journals indexed or recorded in Google Scholar, Copernicus, and others; and d) The latest scientific journals published between 2020-2024.

With these provisions, 38 journals were obtained that discussed financial literacy and investment decisions in the agricultural sector. Journals with agricultural objects were positioned as the main journals to be studied. Along the way, supporting journals emerged to strengthen the findings, namely journals that discuss human resource management practices.

Extraction and Synthesis of Research Results: Data extraction to sort and create metadata after research to be synthesized from various things found in the literature analyzed. The goal is to analyze and evaluate various research results from various literature, and to choose the most appropriate method to integrate the explanation and interpretation of the various findings.

Reporting Research Results: Presentation of research results in research reports is by the provisions of the objectives of the journal intended for publication.

RESULTS

The analysis results (journal search) on literacy and investment decisions for farmers, were obtained from a total of 38 journals. The distribution of the research journals is shown in Figure 1.

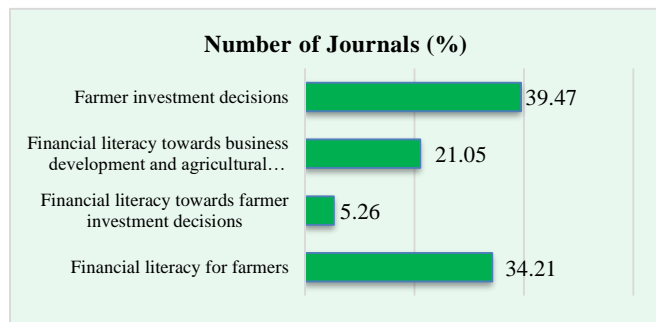


Figure 1. Number of research journals according to research topics financial literacy and farmers' investment decisions.

Judging from its distribution, most research topics were about "farmer investment decisions" with 15 journals or 39.47% of the total journals. The second most were research results with the topic "financial literacy for farmers" with 13 journals or 34.21%. The topic "financial literacy in business development and agricultural development" with 8 journals or 21.05% and

the lowest was the topic "financial literacy in farmer investment decisions" with 2 journals or 5.26%.

Judging from the publication time, the most was done in 2023 with 11 journals or 28.95% of the total journals. Followed by publication in 2024 with 9 journals or 23.68%. This number is likely to increase until the end of 2024. During the 2020-2022 publication period, it was relatively the same, each with 6 journals or 15.79% of the total journals. This information is presented in Figure 2 below,

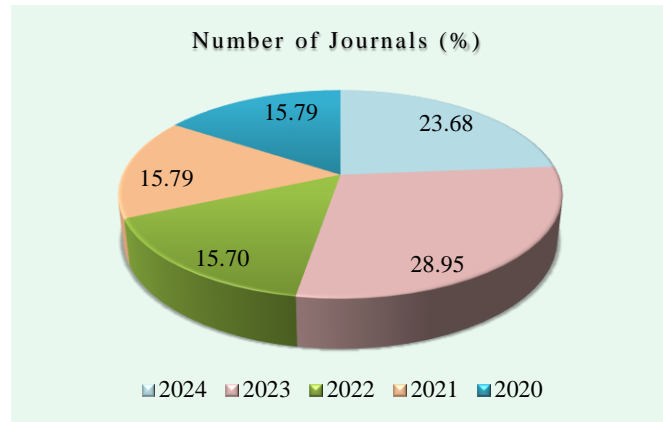


Figure 2. Number of research journals 2020-2024.

Research on financial literacy and farmer investment decisions for agricultural sector development is spread throughout the world. As presented in Figure 3, there are 16 countries in three continents involved in research on the topic. Asia and Africa are spread across 6 countries each, and Europe has as many as 4 countries. The highest frequency of research is in Asia, which is 18 journals with a contribution of around 47.37%. Followed by Africa with 14 journals or 36.84%, Europe with 4 journals or 10.53% and there is literature study research with 2 journals or 5.26%.

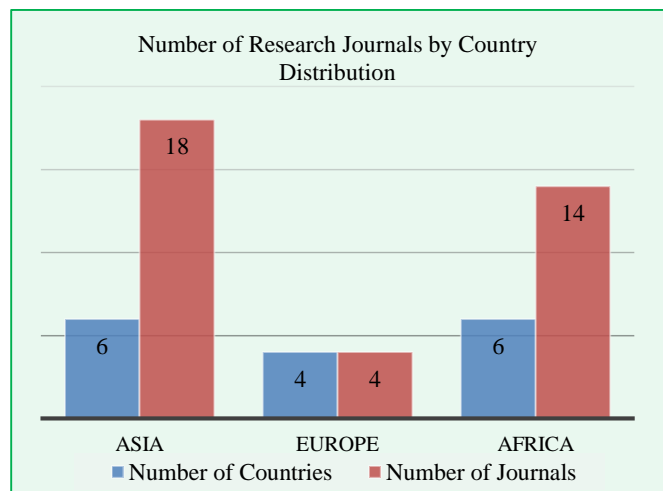


Figure 3. Number of research journals in Asia, Europe and Africa.



Research in Asia is mostly conducted in Indonesia, India, and China with a contribution of more than 10% of the total journals in the world. As seen in Figure 4, during the period 2020-2024, India published 6 journals equivalent to 15.79% of the total journals in the world. India published 5 journals or 13.16% and China published 4 journals or contributed around 10.53%. In Africa, the most research is in Nigeria (10.53%) and Ghana (7.89%). Meanwhile, in Europe such as Ireland, Germany, France, and Romania, each has 1 journal or only contributes 2.63%.

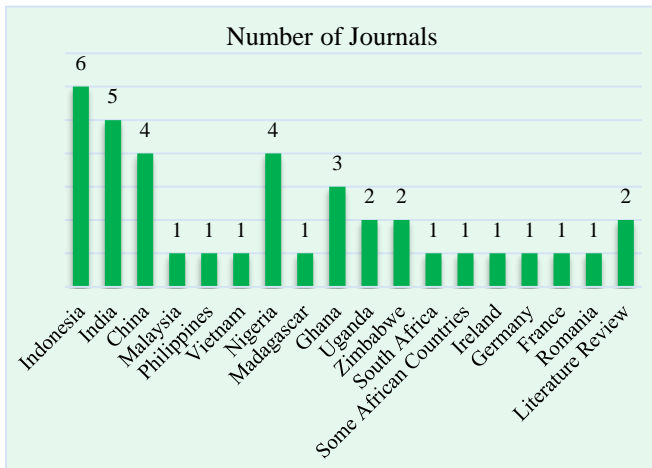


Figure 4. Number of research journals by country.

Financial Literacy for Farmers: As seen in Figure 1, 13 journals are discussing the topic of “financial literacy for farmers”. These research journals are spread across seven countries, 4 countries each in Africa, and 3 countries in Asia. As presented in Figure 5, the frequency of research on financial literacy for farmers is highest in Indonesia, which is 4 journals or 30.77% of the total journals. India, Nigeria, and Ghana are each in second place, and the lowest frequency is China, Madagascar, and Uganda.

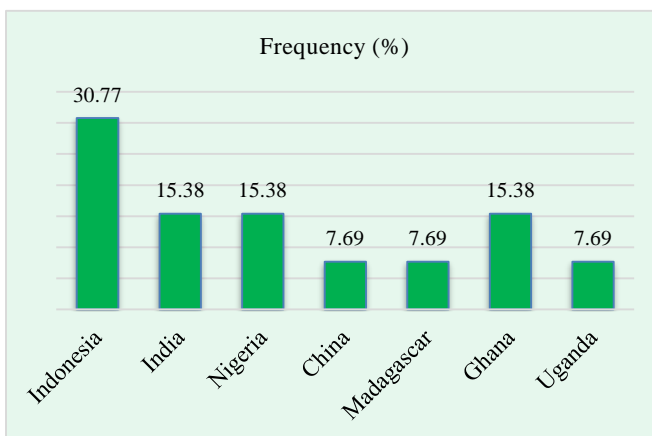


Figure 5. Number of research journals on the topic of financial literacy for farmers.

Most studies on the topic of “financial literacy for farmers” were conducted in 2023 with 5 journals or around 38.46% of the total journals. Then in 2022 around 30.77%, followed by 2021 around 15.38%. The lowest in 2020 and 2024 which only contributed 7.60% of the total journals. This means that there is a decrease in researchers' interest in studying the topic of financial literacy for farmers.

The information in Table 1 shows that there are nine analytical focuses studied by researchers during 2020-2024, where the most frequently studied still focus on two things, namely the level of financial literacy (Charyulu and Selvamani, 2023; Safitri, 2021; Santoso et al., 2020), and household finances (Xu et al., 2023; Falola et al., 2023; Aidoo-Mensah et al., 2022). Of interest is the latest study (2024) on financial literacy in the discussion of the peer-to-peer fintech approach in agricultural business development (Soekarni et al., 2024).

Table 1. Focus topics of financial literacy assessment for farmers.

Focus Analysis	Frequency	Source (Researcher)
1. Peer-to-peer fintech	1	Soekarni et al. (2024)
2. Financial literacy level	3	Charyulu and Selvamani (2023); Safitri (2021); Santoso et al. (2020)
3. Strategic decision making	1	Obi-Anike et al. (2023)
4. Household finances	3	Xu et al. (2023); Falola et al. (2023); Aidoo-Mensah et al. (2022)
5. Credit awareness	1	Sarfo et al. (2023)
6. Urban farmers	1	Sasmita et al. (2022)
7. Financial antecedents	1	Maji and Laha (2022)
8. Determinants of financial literacy	1	Twumasi et al. (2022)
9. Financial knowledge and behavior	1	Proscovia et al. (2021)

Financial Literacy on Farmers' Investment Decisions: The study of financial literacy on farmers' investment decisions during 2020-2024 has become the focus of attention of researchers in China by Liu et al. (2024), and in Nigeria by Benedict et al. (2024). Researchers in other countries have not been interested in discussing investment in the agricultural sector.

Judging from the focus of the analysis, the study of financial literacy as a basis for considering investment decisions in China focuses on the perspective of risk preference and time preference (Liu et al., 2024). Meanwhile, Nigeria focuses on financial innovation services as a shaper of investment decisions in the agricultural sector (Benedict et al., 2024).

Financial Literacy for Business Development and Agricultural Development: The study of financial literacy on business development and agricultural development is quite popular (21.05% of the total journals). The study of this topic



was conducted in six countries in Asia and Africa. As seen in Figure 6, the highest frequency of research was conducted in Zimbabwe and Indonesia, which were the highest, with 2 journals each or 25% each, and the others were in Malaysia, Philippines, South Africa, and Uganda, each with 12.50%.

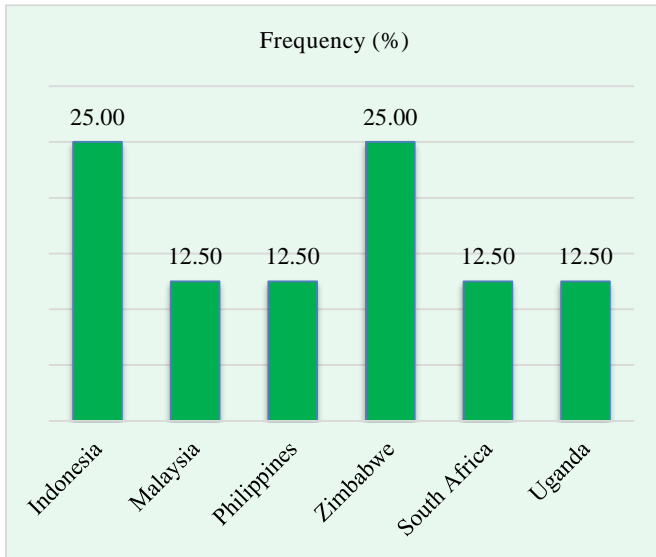


Figure 6. Number of research journals on the topic of financial literacy in business development and agricultural development by country.

Judging from the research time (journal publication), the most was conducted in 2024, namely 4 journals or equivalent to 50% of the total journals, followed by 2023 at around 37.50%, and the lowest in 2020 at only 12.50%. During 2021 and 2022, no journals were found.

Table 2. Focus of financial literacy study topics on business development and agricultural development.

Focus Analysis	Frequency	Source (Researcher)
1. Youth entrepreneurship	1	Rashid <i>et al.</i> (2024)
2. Empowerment of farmers	1	Fronza (2024)
3. Factors forming financial literacy in agricultural business development	3	Lilian <i>et al.</i> (2024); Khairunnisa <i>et al.</i> (2024); Tomasi (2020)
4. Literacy for women farmers	1	Gumbo <i>et al.</i> (2023)
5. Agricultural financial literacy and inclusion	1	Akande <i>et al.</i> (2023)
6. Increasing farmers' income	1	Sekti <i>et al.</i> (2023)

There are six most frequently discussed analysis focuses during the 2020-2024 period. As seen in Table 2, the analysis focus that attracted researchers' attention was on the factors

forming financial literacy in agricultural business development (3 journals) as reported by Lilian *et al.* (2024); Khairunnisa *et al.* (2024); Tomasi (2020). For other analysis focuses, they appear evenly distributed, with 1 journal each.

Farmers' Investment Decisions: As shown in Figure 1, research on the topic of "investment decisions for farmers" is quite popular with researchers. Research on this topic is very consistent during the period 2020-2024. As shown in Figure 7, at the beginning of the observation, precisely in 2020-2021, it was quite popular with researchers with the number of studies published in 4 journals each or with a total contribution of around 53.33%. Until 2024, the intensity of journal publications fluctuated quite a bit, decreasing in 2022 (13.33%) and after that starting to increase. By looking at this pattern, the number of studies until the end of 2024 is likely to increase.

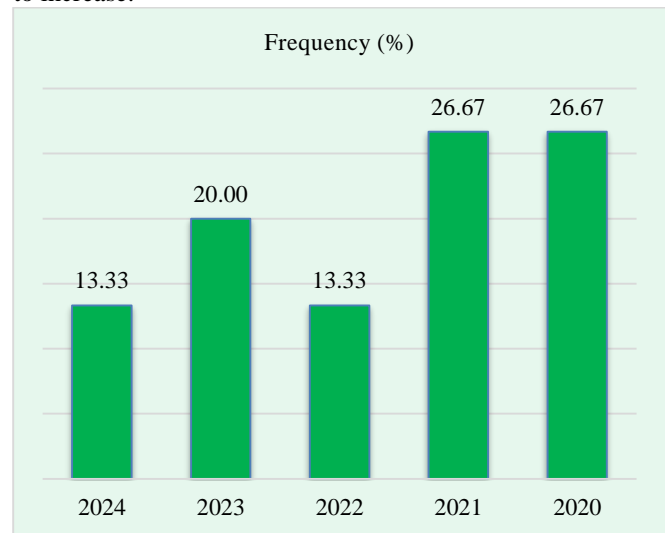


Figure 7. Number of research journals on the topic of investment decisions for farmers 2020-2024.

The distribution of countries of researchers who study and publish journals on "investment decisions for farmers" is quite large compared to other topics. Of the total 15 journals, India is the largest, namely 3 journals contributing around 20%, followed by China around 13.33%. Meanwhile, other countries each contribute 6.67%. As a difference from other topics, studies on investment decisions for farmers are spread across Europe, Africa, and Asia. The distribution of journals by country is presented in Figure 8.

The focus of the analysis analyzed by the research on investment decisions for farmers is presented in Table 3. Nine things are the focus of the researchers' analysis, where the most frequent is regarding the factors that influence/drive investment decisions (Russo *et al.*, 2024; Taramuel-Taramuel *et al.*, 2023; Manocha *et al.*, 2023; Moldovan and Beleiu, 2020; Wang *et al.*, 2020).



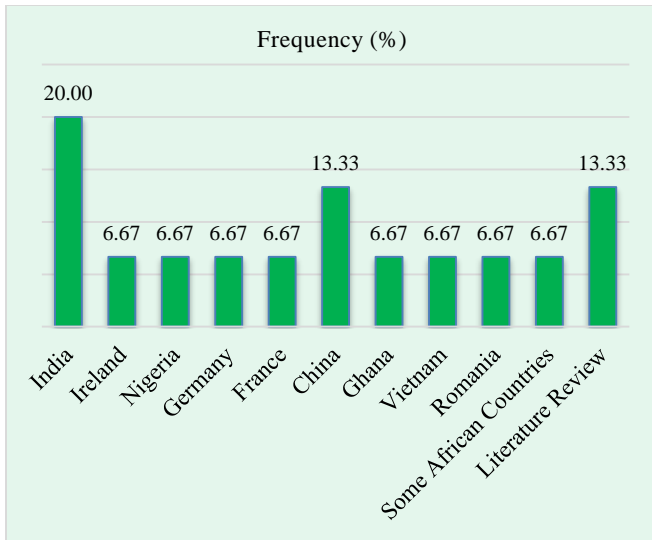


Figure 8. Number of research journals on the topic of investment decisions for farmers by country.

Table 3. The focus of study topics on investment decisions for farmers.

Focus Analysis	Frequency	Source (Researcher)
1. Factors that influence/drive investment decisions	5	Russo <i>et al.</i> (2024); Taramuel-Taramuel <i>et al.</i> (2023); Manocha <i>et al.</i> (2023); Moldovan and Beleiu (2020); Wang <i>et al.</i> (2020)
2. Land security and investment risks	2	Akber <i>et al.</i> (2024); Bradfield <i>et al.</i> (2023)
3. The impact on microcredit	1	Kolapo (2022)
4. Cognitive bias (illusion)	1	Labajova <i>et al.</i> (2022)
5. Food crop investment	1	Femenia <i>et al.</i> (2021)
6. Economic growth (agricultural sector)	1	Akber and Paltasingh (2021)
7. Production planning	1	Qian (2021)
8. <i>Climate-Smart-agricultural</i>	2	Ng'ang'a <i>et al.</i> (2021); Yet <i>et al.</i> (2020)
9. Investment decision challenges	1	Newman and Tarp (2020)

The second most frequently studied focus of analysis by researchers is on land security and investment risk (Akber *et al.*, 2024; Bradfield *et al.*, 2023), and climate change adaptation with climate-smart-agricultural (Ng'ang'a *et al.*, 2021; Yet *et al.*, 2020).

DISCUSSION

The increasing interest of researchers in researching financial literacy and farmers' investment decisions, the more updated scientific knowledge will be, all of which will return to practical implications for farmers in financial literacy which

is useful in decision-making in agricultural investment practices. In the future, the basis for developing financial literacy, and farmers' investment decisions in terms of business development and agricultural development in general will increasingly focus on research objects in China, India, and Indonesia. The empirical fact is that these three countries are the countries with the largest agricultural potential, both in terms of land and the diversity of agricultural commodities cultivated.

African countries are also preparing themselves to face the role of financial literacy for farmers. The focus of analysis continues to be studied to answer challenges and prepare farmer resources starting from the household level, financial service innovations in supporting agricultural investment, to smart agricultural models facing climate change.

With the data presented in this study, it is clear that researchers have contributed to producing empirical studies that are very useful in preparing farmers' financial literacy so that every financial decision taken is free or has minimal risk. At the same time, researchers have provided knowledge that is practically useful for the Government in preparing a policy framework with all the supporting infrastructure for financial literacy and agricultural investment. This is certainly very urgent considering that financial digitalization is being massively implemented. In this regard, Soekarni *et al.* (2024) have offered a *peer-to-peer fintech* scheme even in terms of climate change mitigation with *climate-Smart-agricultural* (Ng'ang'a *et al.*, 2021; Yet *et al.*, 2020).

Many researchers such as Liu *et al.* (2024); Benedict *et al.* (2024); Akber *et al.* (2024); Khairunnisa *et al.* (2024); Obi-Anike *et al.* (2023); Xu *et al.* (2023); Akande *et al.* (2023); Bradfield *et al.* (2023); Taramuel-Taramuel *et al.* (2023) raised concerns about the gap between field facts and theoretical evidence regarding the implementation of farmer human resources. Observing the research results of Labajova *et al.* (2022), and the implementation of human resources as reported by Adil *et al.* (2022); Dhungana *et al.* (2022); Armansyah (2022); Rahman and Gan (2020); Suprasta and Nuryasman (2020); Christopher (2020); Akinkoye and Bankole (2020); Pokharel (2020); Elhussein and Abdelgadir (2020) that the future agenda in preparing human resources is about illusions (cognitive biases) and emotional biases that contribute to increased literacy and investment decision making.

Likewise, financial literacy with investment decisions still receives attention from researchers, because on the one hand, there is a proven good correlation (Adil *et al.*, 2022; Kanagasabai and Aggarwal, 2020; Putri and Hikmah, 2020; Rosdiana, 2020; Suprasta and Nuryasman, 2020). On the other hand, the two are still inconsistent because financial literacy has not contributed significantly to investment decision-making (Pradhana 2018; Pradikasari and Isbanah, 2018).



Taking into account the above review, the future agenda in improving financial literacy to strengthen the position of investment decision-making based on cognitive bias and emotional bias is shown in the conceptual framework in Figure 9.

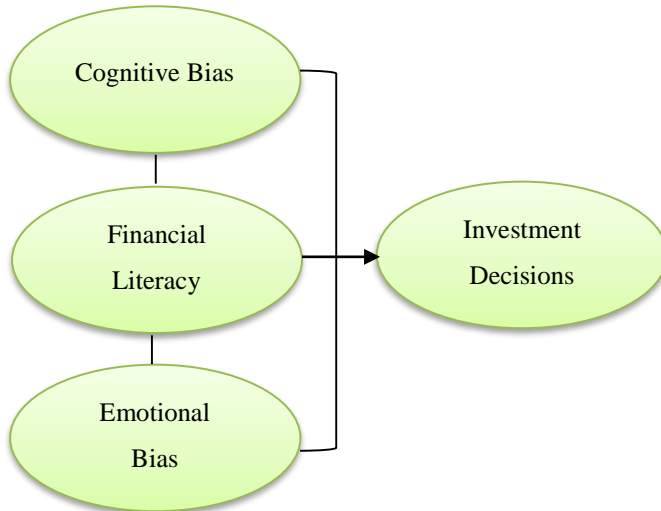


Figure 9. Conceptual framework of future research agenda in human resource management review.

Conclusion: Studies on the role of financial literacy and investment decisions for farmers and agricultural development are more widely discussed in Asia and Africa and some in Europe. Several studies report that Asia and Africa still have a level of literacy that is not so good compared to Europe. The results of the study focus on mapping as well as representing the completion of empirical problems in four things; a) factors that influence/drive investment decisions; b) factors that form financial literacy in agricultural business development; c) household finances; and d) level of financial literacy. Furthermore, the future agenda that needs attention in human resource management practices in more general cases is related to financial literacy, cognitive bias, and emotional bias in reflecting decision-making in investing.

Authors' contributions: All authors contributed together from the beginning of the research to the presentation of the published manuscript. The difference is that there are additional specific tasks for the corresponding authors.

Conflict of interest: The contents of this manuscript are free from conflicts of interest, both among fellow authors and with external parties.

Acknowledgments: The research was purely on the author's initiative, so it did not involve other parties (respondents and informants). Thus, no special recognition was given.

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Informed consent: N/A

Ethical statement: This research does not involve respondents, animals and excessive use of natural resources.

Consent to publication: The contents of the manuscript have been approved by all authors for publication as stated in the author's statement.

SDGs addressed: No poverty, gender equality, and reduced inequality.

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