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Article

Financial literacy and sustainability of rural microfinance: The mediating effect of governance

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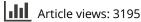
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Apriani Dorkas Rambu Atahau

DEVELOPMENT ECONOMICS | RESEARCH ARTICLE

Financial literacy and sustainability of rural microfinance: The mediating effect of governance

Apriani Dorkas Rambu Atahau¹, Imanuel Madea Sakti¹*, Alliny Namilana Rambu Hutar², Andrian Dolfriandra Huruta¹ and Min-Sun Kim³

Abstract: This research aims to examine the mediating role of microfinance governance in the relationship between financial literacy and microfinance sustainability. The research used the purposive sampling method to collect data from the Women Farmers Group (WFG) "Tapa Walla Badi" in Mbatakapidu village, East Sumba, Indonesia. The survey was conducted from November through December 2021 with the valid sample for analysis was 200 questionnaires. The

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PUBLIC INTEREST STATEMENT

This study aims to examine the sustainability of microfinance institutions (MFIs) in rural area of Sumba, East Nusa Tenggara, Indonesia. Accordingly, this research proposed MFIs governance as the mediating variable with financial literacy served as the independent variable. By conducting questionnaire survey in conjunction with focus group discussions, our findings show that rural MFIs sustainability is directly determined by financial literacy and indirectly determined by MFIs governance. Policy implications proposed based on research findings are inclusion of financial literacy in formal and nonformal education curriculum and policies related to financial inclusion to provide greater access of financial services for the poor.

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© 2023 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent. Partial Least Squares-Structural Equation Model (PLS-SEM) was used for analysis. The bootstrapping and the Sobel test were required for a better understanding of the findings. Robust test and focus group discussion (FGD) made our methodology more reliable. The findings show that financial literacy plays an important role in the transformation of rural microfinance institutions (MFIs). Financial literacy works positively on the sustainability of rural microfinance via governance. Age, gender, education, and employment situation were taken into account in financial literacy. This research provides a comprehensive view to policymakers in developing rural MFIs, thus implies the urgency to promote financial literacy and improve governance structures within MFIs. The local government may create pro-financial inclusion policies that support sustainable MFIs by implementing financial literacy curriculum in formal and non-formal education.

Subjects: Statistics for Business, Finance & Economics; Economics and Development; Development Economics

Keywords: financial literacy; microfinance sustainability; governance; financial literacy index; rural microfinance institutions

JEL Classification: G21; G30; G53

1. Introduction

A microfinance institution (MFI) is widely acknowledged as a critical strategy for achieving sustainable economic growth. MFIs reach the poor and low-income people by helping them improve themselves for a better life. This is related to the Sustainable Development Goals (SDGs), a set of global goals adopted by the United Nations in 2015 to end poverty, protect the planet, and ensure prosperity for all. Financial literacy and microfinance sustainability are critical components of achieving SDGs. By providing access to financial services and supporting sustainable economic development, microfinance institutions can help addressing poverty, inequality, and climate change, while financial literacy may empower clients to make informed financial decisions that support their economic well-being and the sustainability of microfinance institutions. Specifically, MFIs address SDG 1 (no poverty) by providing financial services to marginalized communities and SGD 5 (gender equality) when serving financial services for women. MFIs also addressing SDG 8 (decent work and economic growth) by providing small business with the capital needed to grow and create jobs. In addition, MFIs practice to provide financial services for those living in rural areas with low income is a manifestation of addressing SDG 10 (reduce inequalities). Lastly, the providence of financial services for sustainable agriculture, renewable energy, and other climate friendly initiatives is MFIs effort to address SDG 13 (climate action).

There is currently a considerable attention to the development of MFIs in Indonesia. They are expected to play a crucial role in achieving the goal of becoming a developed country by 2030 (Effendi, 2010). MFIs contribute to reducing poverty and improving society's living standards (Agbola et al., 2017). Poor population (27.55 million people in September 2020) (Central Bureau of Statistics, 2020) and low level of financial inclusion serve as a main drive in motivating MFIs. But a large population of Indonesians inhabit in rural areas, and MFIs has been managing in a traditional way, mostly informal with very few formal documentations. The management of rural MFIs mostly relied on soft-information through relationship lending, not based on hard-information implemented by banks and other more developed financial institutions. These delay the development of MFIs, even though it shows development possibility. An increasing awareness of environmental conservation requires eco-friendly management (green business). MFI sustainability is the key of the change of conventional MFIs into green MFIs (Chirambo, 2017; Moser & Gonzalez, 2016). Atahau et al. (2020) suggested that MFI governance plays

a crucial role in MFI reform for its sustainability. Good governance generally leads to sustainability. The implementation of good governance is shown by the company's commitment to obtain company profits (profit), care for the community (people), protect the environment (planet), develop the community (prosperity), and become partners for the community (partnership). This enables companies to achieve corporate sustainability (Setyahadi & Narsa, 2020). Considering that governance is dictated by management, it is evident that a manager's ability is critical.

Financial literacy is the knowledge and ability to manage financial situations to improve one's well-being (Akmal & Saputra, 2016). It entails understanding of investing, saving, and consumption (Ariadi et al., 2015). The terms "Financial Literacy" and "Financial Knowledge" are generally used interchangeably in previous studies (Yang & Lester, 2016). Ariadi et al. (2015) found that there is a significant relationship among financial literacy, gender, investment allowances, savings, and consumption. The level of financial literacy involves knowledge and understanding of money and its transaction; financial management (OECD, 2013).

MFI managers should be financially literate to give a better service and operate MFIs effectively. MFIs may be vulnerable to financial risk and insolvency if they lack financial literacy. An index of financial literacy of rural MFI manager has not been devised yet. The index could serve to judge whether to empower rural MFI manager. Sim and Prabhu (2014) found that MFIs majorly rely on capital income from loan interest. It forces MFIs to impose high interest rates on loans. It causes a serious default. This circumstance asks MFI manager to be equipped with financial competence for developing sound policies. The lack of financial literacy impairs financial management. In that sense, financial literacy is precondition for running MFI. A favorable and strong correlation between financial literacy and loan repayment was found by Baidoo et al. (2020). This indicates that increasing financial literacy will result in much improved loan payback, which will ultimately maintain the viability of the financial institutions. In addition, Baidoo et al. (2018) have investigated how financial literacy affects saving choices. They show evidence that encouraging domestic saving depends on financial literacy. The comprehensive policy package ought to include improving financial literacy. This was done in order to increase domestic saving, which is a requirement for investment and long-term economic growth. Even though there have been many studies on microfinance that have focused on financial literacy, research into the topics is rarely found.

Microfinance institutions play a critical role in providing financial services to undeserved and marginalized communities. However, many MFIs struggle with sustainability and face challenges in achieving their social mission. Microfinance institutions governance is critical to improving the effectiveness of microfinance institutions, enhancing financial inclusion, strengthening the business case for microfinance, and informing policy and practice in the sector. When microfinance institutions are well-governed, they are better able to manage risks, maintain financial stability, and build trust with clients and stakeholders. Good governance is essential for the long-term sustainability of MFIs because a well-governed MFIs is able to attract investors, build trust with clients, and manage risks effectively. It also ensures that the institution operates in an ethical and responsible manner, which can help to maintain its reputation and support from stakeholders in the long run.

In order to present a novelty, this study provides information on the financial literacy index. Then, we also examine the mediating role of MFI governance in the relationship between financial literacy and MFI sustainability. Previous studies only focused on governance as mediating roles in the corporate context. Therefore, this study specifically focused on governance in the MFIs context. The research offers a comprehensive view of financial management. And it gets policymakers to establish system to increase financial literacy.

2. Theoretical background and hypotheses

2.1. Sustainability theory of microfinance

Some of the well-known theories related to sustainability of microfinance are the Financial Capability Framework, the Social Capital Theory, the Institutional Theory and the Human Capital Theory. Financial Capability Framework focusing on financial capability as the key components of financial sustainability whereas Social Capital Theory emphasizing the importance of social network in promoting financial sustainability. On the other hand, the Institutional Theory placing more attention to the structure and culture of MFIs. Lastly, the Human Capital Theory put emphasize on the skills and knowledge of MFIs human resources as the critical factor to MFIs sustainability.

According to The Asia Fondation (2003), MFI sustainability is the capacity to establish a broad network of services and institutions. MFI sustainability is considered in the context of well-being (Cull et al., 2007). MFI institutions strive to establish a sound platform to attract people, who are economically active but are not being served well by conventional system. The welfare model indicates the breadth of financial institutions' reach to the poor population. Robinson (2002) claimed that the sustainability of an MFI is basically characterized by a commercial desire to earn profits. Credit transaction and savings allow financial institutions to reach a considerable number of clients. In that same vein, financial institutions provide financial services to the poor population, and it becomes engaging the poor population in economic activities. Financial services such as loans may provide capital needed to grow businesses and create jobs, thus making it possible for the poor to engage in economic activities.

A well-funded MFI plays an important role in overcoming institutional poverty (institutional approval) and securing community well-being (welfarist approach). Husna et al. (2019) proved that a sustainable *Baitul Maal wa Tamwil* (BMT) (a Sharia MFI that has been run in Indonesia since 1992) improves the welfare of its members by ameliorating income, family education, health, and quality of living. Husna et al. (2019) claimed that an effective governance of organization makes BMT a more sustainable MFI in alleviating poverty.

2.2. Financial literacy, governance, and microfinance sustainability

Financial literacy is a comprehensive ability of making sound financial decisions and obtaining financial well-being (OECD INFE, 2011). Financial Authority Services (2019) defined that financial literacy is competence that manages finance effectively. According to the 2019 National Survey of Financial Literacy and Inclusion (SNLIK), the financial literacy index grew from 8.33% to 38.03%, while financial inclusion increased from 8.39% to 76.19%. Financial literacy is still restricted to the banking industry (36.12%), insurance (19.40%), pawnshops (17.81%), pension funds (14.13%), finance (15.17%), the capital market (4.92%), and MFIs (0.85%). MFIs only accounts for 0.72% in banking sector (73.88%) of financial inclusion. This indicates that there is still a significant gap between literacy and public financial inclusion. Agustin (2011) claimed that the MFIs play a vital role in rural economy in many ways. MFIs are generally located in the rural community they serve; they provide an access to financial resource in the rural area; they use more simplified processes and procedures that rural community prefers; they have less strict regulation on loan; and they disburse money with propriety. MFI managers are knowledgeable about the characteristics of micro and small companies in the village. Sociocultural tie and individual interaction between the managers and companies spare moral hazard in credit repayment. Generally, financial literacy highly correlates with well-being of rural households. Brillianti and Kautsar (2020) found that 2.88% households with financial knowledge are wealthy. Households with savings account are 5.36% less likely to be impoverished than those without. MFIs cannot be managed effectively without financial literacy. This would lead to financial issues and bankruptcy. Sim and Prabhu (2014) found that MFIs have limited financial resources, and that their major revenue comes from interest from their loan portfolio. Because limited financial ability of rural households causes default, it prompts MFIs to charge high interest on loan. It is the reason behind MFIs' exclusion of distant areas. High interest rate produces high default rate, and the high default rate causes

financial aggravation in MFIs. Thus, the understanding of how it can be managed prevents MFIs from financial mismanagement. In other words, lack of financial literacy triggers financial distress both officially and personally. A MFI manager with a personal financial trouble is unable to manage finance properly and susceptible to financial fraud. A financial planning program enables the MFI manager to build short-term and long-term financial strategies. Improved financial literacy leads to an effective financial management both officially and personally. Ermawati et al. (2019) found that financial literacy influences the financial performance of civil servant cooperatives in Bandar Lampung. The performance of cooperatives hinges on financial literacy and effectiveness of financial management.

Wahyono and Hutahayan (2021) claimed that financial literacy has a positive effect on competence and business performance in small and medium textile industries in Java and Bali. Financial literacy helps business leaders to recognize and respond to changes in the business and economic climate, as well as to use finance strategy to make right decisions that drive an improved and sustainable performance. Business owners with a proper financial literacy can establish financial strategies to secure their company's long-term viability (Sanistasya et al., 2019). In this sense, achievement in performance and sustainability in MFIs is conditional upon a proper financial literacy and MFIs' involvement in rural community. Although there were numerous studies of microfinance that focused on financial literacy, studies concerning the issues are still rarely conducted in Indonesia using financial literacy index. We found only the study of Lee and Huruta (2022) that establishing women's role-based local financial literacy is an alternative strategy for sustainable green microfinance. Gender-targeted programs need to consider proliteracy policies for achieving green microfinance sustainability. Therefore, this study aims to present detail elaboration on financial literacy index by presenting empirical evidence from Indonesia.

2.3. Why financial literacy matters? A lesson learned

Researchers can evaluate whether financial decision-making is influenced by literacy by including questions on financial literacy (Lusardi, 2015). Financial literacy and a variety of behaviors have been linked in numerous studies (Agustin, 2011; Cull et al., 2007; Hastings & Tejeda-Ashton, 2008; Lusardi & Mitchell, 2009; Lusardi & Scheresberg, 2013; Maarten et al., 2012). Due to its relationship to saving behavior and investment portfolio selection, financial literacy is essential (Lusardi & Tufano, 2015). Baidoo et al. (2018) demonstrate that enhancing financial literacy should be a part of a comprehensive set of policies targeted at raising domestic saving, which is a requirement for investment choices, people will consume less than their income during periods of high earnings in order to maintain consumption during periods of low earnings (e.g. after retirement). Individuals, communities, nations, and society as a whole are all affected by financial literacy on financial decision-making (Lusardi, 2015). Individual and household assets as well as borrowing and debt can all be related to financial literacy (Lusardi & Scheresberg, 2013).

This is a significant finding since people must make financial decisions well into their old age, and the incidence of financial scams that target the elderly is a growing source of concern. Financial literacy across the genders differs significantly, with women showing lower levels of understanding than males, especially when it comes to risk diversification (Lusardi, 2015). According to Lusardi and Mitchell (2011), these gender disparities exist in all nations. Financial literacy varies widely across education levels as well (Lusardi, 2015). According to Baidoo et al. (2020), increasing financial literacy through education will greatly enhance loan repayment, which will ultimately assure the sustainability of the financial institutions.

2.4. Hypothesis development and research framework

Morgan and Pontines (2014) suggested that efforts of enhancing financial literacy benefit financial system stability. Prasad (2010) also noted that financial literacy ameliorates efficiency in financial intermediation, and that it helps financial institutions manage and sustain their stability. Husna

et al. (2019) found that sustainability hinges critically on an effective governance and quality management. A good governance is indispensable for building confidence of investor and customer (Chenuos et al., 2014). Generally, there is no deposit protection system for MFI depositors. It makes it imperative for MFIs to have a strong governance. A good governance improves the performance of MFIs (Brickley et al., 1994; Byrd & Hickman, 1992). Considered in this framework, financial literacy as well as socioeconomic circumstance is essential to sustainability of MFIs. Hypotheses are built as follows:

- H1 Financial literacy positively affects microfinance sustainability.
- H2 Financial literacy positively affects microfinance governance.
- H3 Microfinance governance positively affects microfinance sustainability.

H4 Financial literacy indirectly affects microfinance sustainability via microfinance governance.

Based on these hypotheses, we develop a research framework (Figure 1) as follows:

3. Research methodology

3.1. Sample

The data was collected from the Women Farmers Group (WFG) "Tapa Walla Badi" in Mbatakapidu village, East Sumba, Indonesia. The area was chosen based on previous research (Atahau et al., 2020, 2021; Soegiono et al., 2019). We select women farmer because those marginalized group have successfully run MFIs which lasts for more than 30 years. Selection of respondents is crucial for surveys since individuals are continually seeking knowledge and information. The research used the purposive sampling method to collect data. Both qualitative and quantitative research methods may also employ purposive sampling. The method's inherent bias makes it more effective. Even when tested against random probability sampling, the approach remains reliable. The selection of the purposive sample is essential to the accuracy of the data collected. As a result, it's crucial to ensure the respondent's reliability and competency (Tongco, 2007).

A respondent is purposefully chosen using the purposive sampling technique (also known as judgment sampling) based on the traits they possess. To put it simply, the researcher selects what

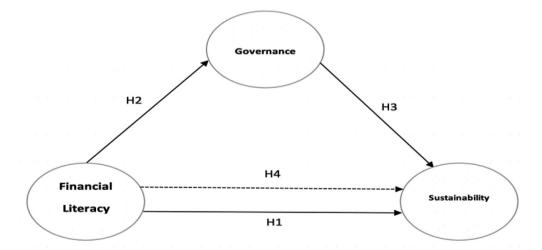
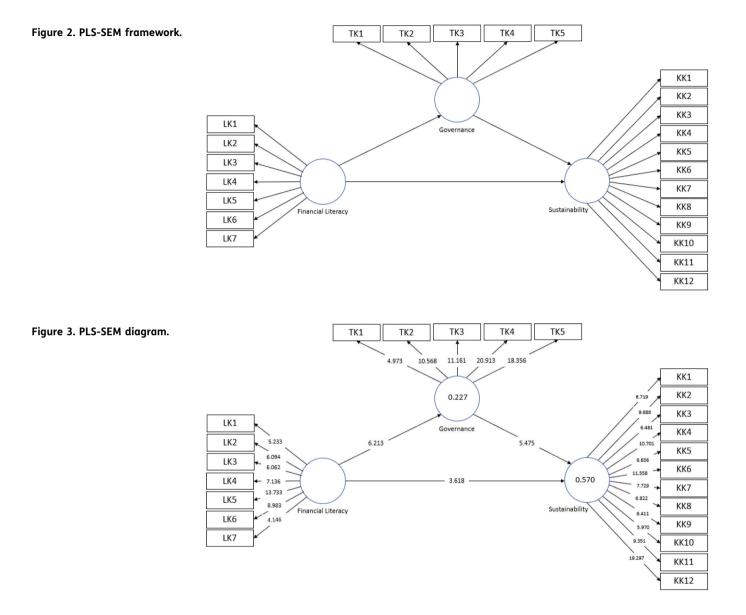


Figure 1. Research framework.



respondent is necessary and then searches for sources of that information who can and are willing to do so due to their knowledge or experience (Lewis & Sheppard, 2006). The purposive sampling is based on the researcher's judgment when selecting the units. Such judgments mainly focus on the respondent's understandability on the local values related to financial literacy, governance, and potential drivers of microfinance sustainability. The survey was conducted for November through December 2021. The minimal sample size is 91 for statistical power of 80% with four pointing arrows (Cohen, 1992). The sample size was determined by the PLS-SEM's sample size requirement (minimum R² is 0.25 and 1% probability of error). All members (population) participated in the survey as 215 respondents. But incomplete responses and respondents that did not meet the criteria were found in 15 questionnaires (6.977%). It was counted as invalid. Consequently, we had 200 valid sample for analysis. Structured focus group discussion was also used to collect data. The transformation model of rural MFIs used focus groups (FGD) to observe MFIs' perception about financial literacy.

4. Variable measurement

Table 1 displays the definition and measurement of each variable.

4.1. Construction of financial literacy index

The financial literacy index (FLI) was formed by calculating a weighted average of financial knowledge, attitudes and behavior. The score of financial knowledge was obtained by adding up a score of each indicator. Correct answers were counted as 5, incorrect answers were counted as 0, and do not know answers were counted as 3. The scores of attitudes and financial behavior were individually obtained by adding up a score of each indicator. The index calculation formula was built as follows (Ferdinand, 2014):

FLI score = W1 x X1 + W2 x X2 + W3 x X3

W1 = weight of financial knowledge (50%)

W2 = weight of financial attitude (25%)

W3 = weight of financial behavior (25%)

- X1 = score of financial knowledge
- X2 = score of financial attitudes

X3 = score of financial behavior

Table 1.	Variable measurement		
No.	Variable	Operational definition	Scale
1.	Education	The highest level of education completed by the respondents.	Ordinal (See: Questionnaire)
2.	Age	The grouping category appropriate for the respondent's age.	Interval (See: Questionnaire)
3.	Occupation	The respondent's role in society and it can be a job, business, employment or profession.	Ordinal (See: Questionnaire)
4.	Financial literacy	The capacity to efficiently manage respondent's financial resources for lifetime financial stability.	5 Likert (See: Questionnaire)
5.	MFI governance	Decision-making and implementation procedures at MFIs.	5 Likert (See: Questionnaire)
6.	MFI sustainability	MFIs incorporate the economic, social, and environmental aspects of sustainability.	5 Likert (See: Questionnaire)

Table 2. FLI score for model 1					
FLI score	Model 1				
4-18.5	Low				
>18.5-33	Medium				
>33-47.5	High				

(1)

Table 3. FLI score for model 2	
FLI score	Model 2
4-34.08	Low
>34.08-47.5	High

FLI is a measure of financial literacy as a composite index that aggregate responses to a series of questions designed to measure financial literacy. The index is weighted based on three components: knowledge (50%), attitude (25%) and behavior (25%). The selection of these components is based on the argumentation that the expertise of a MFIs manager is not solely determined by the knowledge but also supported by attitude and behavior. We placed more emphasis on knowledge according to our focus on financial literacy by placing more weight to this component (50%). We then measure the score for each component to calculate the weighted average score of financial literacy. This index is based on FLI index by Lusardi and Mitchell (2011) with improvement on accommodating the attitude and behavior components. We retain the coverage of financial concepts use in Lusardi and Mitchell (2011) FLI namely: interest rates, inflation and risk diversification. Nonetheless, we use a higher scale (10–100), with higher values indicating greater financial literacy.

The index interval is obtained by calculating the difference between the maximum and minimum scores from the FLI. In addition, the outcome was divided into three categories (low, medium, high), as follows:

$$\frac{\text{maxFLI} - \text{minFLI}}{3} = \frac{47.5 - 4}{3} = 14.5$$
 (2)

In model 2 (robustness check), FLI was divided into two categories: low and high financial literacy. The average score of the FLI is as follows:

5. Model measures

In all items in following measures, we used 5-point Likert-type scales (1 is equal to strongly disagree and 5 is equal to strongly agree). The seven-items were used for the first latent variable (financial literacy-LK). The five-items were used for the second latent variable (governance-TK). The 12 items were used for the third latent variable (MFI's sustainability-KK). Figure 2 highlights PLS-SEM framework.

Before examining hypotheses, we used the reflective measurement approach to check the validity and reliability (outer loadings, rho A, composite ratio, average variance extracted, and Cronbach's alpha).

6. Empirical results

6.1. Respondent characteristics

Table 2 highlights FLI score for model 1. Table 3 represents FLI score for model 2, and Table 4 shows respondent characteristics in gender and financial literacy.

As shown in Table 4, the numbers of male (99) and female (101) are well-balanced. It also indicates that the Women Farmers Group (WFG) is able to engage male in WFG activities. In model 1, most of respondents (131) have a high FLI, while 61 have a medium FLI, and only 8 have a low FLI. When using two categories in Model 2, 117 have a high FLI, while 83 have a low FLI. It indicates that a person shown as a high or medium FLI in model 1 has a low FLI. An outcome

differs with the category between 2 models. Nevertheless, it indicates that most of respondents, especially females, have high a FLI.

Three categories are shown in Table 5. It shows that the actual number of WFG increases with age. People with a high FLI are aged 41 and above (83 respondents consist of 27 females and 29 males). They dominate WFG activities. The ratio of males to females also increases substantially with age. FLI also differs with age group. The least number of people have a high FLI in the group aged 26 to 30, while the greatest number of people have a high FLI in the group aged 41 and above. The ratio of a high FLI to a medium FLI in the group aged 25 and under is higher than that in the group aged between 26 and 35. The engagement of aged 25 and under in the WFG is linked to the scarcity of official work opportunity in Sumba. It exemplifies that many of them turn to informal employment activities.

As displayed in Table 6, many of the respondents (79) did not go to or drop out of primary school. Only 52 respondents complete a primary or junior high school. It demonstrates that the majority of respondents did not complete a senior high school. Twenty respondents (10%) have a diploma at a tertiary institution. The ratio (percentage) of a high LFI shows no correlation with the level of education. Because respondents who did not complete a primary school show the lowest ratio of a high LFI (32/64), while respondents who completed a junior high school show the highest ratio (20/26) of a high LFI. Also, respondents who completed a senior high school (23/49) or tertiary institution (8/12) show lower ratio of a high LFI than respondents who completed a junior high school (20/26) or primary school (19/26) or no any education record (11/15). It proves that a high educational level features a high FLI. This finding is parallel with research conducted in Portuguese where education level of investors positively affects financial literacy which translated into better investment diversification (Abreu & Mendes, 2010). The ratio of female with a high FLI is higher than that of male with a high FLI in the following educational levels: no education record (5/

Table 4. R	Table 4. Respondent characteristics based on gender and financial literacy								
Model 1				Mo	del 2				
FLI	Male	Female	Total	FLI	Male	Female	Total		
Low	5	3	8	Low	46	37	83		
Medium	35	26	61	High	53	64	117		
High	59	72	131	Total	99	101	200		
Total	99	101	200						

Table 5. Respondent characteristics based on age, gender and financial literacy

	Model 1									
	Low	ow FLI Medium FLI		High						
Age	Male	Female	Male	Female	Male	Female	Total			
≤ 20	0	0	3	0	3	3	9			
21-25	1	0	7	2	4	11	25			
26-30	0	0	7	4	5	9	25			
31-35	0	0	5	6	7	10	28			
36-40	0	0	5	2	11	12	30			
≥41	4	3	8	12	29	27	83			
Total	5	3	35	26	59	72	200			

Table 6. Respondent characteristics in education, gender and financial literacy									
Model 1									
	Lov	v FLI	Mediu	um FLI	Higl	n FLI			
Education	Male	Female	Male	Female	Male	Female	Total		
No education	1	0	2	1	6	5	15		
Primary school drop out	3	2	18	9	19	13	64		
Primary school	0	0	2	5	9	10	26		
Junior High School	0	0	3	2	7	14	26		
Senior High School	0	0	8	8	11	22	49		
Diploma	0	0	1	0	2	5	8		
University	1	1	1	1	5	3	12		
Total	5	3	35	26	59	72	200		

6 versus 6/9), primary school incompletion (13/24 versus 19/40), junior high school completion (14/ 16 versus 7/10), high school completion (22/30 versus 11/19) and diploma completion (5/5 versus 3/5). The ratio of male with a high FLI is higher than that of female with a high LFI only in the following two educational levels: primary school completion (9/11 versus 10/15) and degree completion (5/7 versus 3/5). Generally, the ratio of female with a high FLI (72/101) is higher than that of male with a high LFI (59/99).

As presented in Table 7, the majority of respondents are farmers (132). The farmers are made up of 93 males and 39 females. The second largest group is housewives (all females). The ratio of housewife with a high FLI (44/56) is higher than the ratio of farmers with a high ratio (76/132). And the ratio of female farmer with a high LFI (23/39) is higher than that of male farmer with a high LFI (53/93). In sum, it illustrates those females with a high LFI outnumber males.

6.2. Descriptive statistics

This research classifies the knowledge aspects in financial literacy (questions E1–E11 in the questionnaire) into three categories: low understanding (0–1.66), medium understanding (1.67–3.33), and high understanding (3.34–5). As mentioned before, the research included a robustness check by setting two categories with a median value of 2.5. An indicator with an average value of 0–2.5 denotes that respondents' understanding is low. An indicator with an average value of 2.6–5 shows respondent's understanding is high.

As highlighted in Table 8, respondents have average understanding of financial literacy in Model 1: identity requirements (4.39), money illusions (3.895), price discounts (3.805), value of money (3.765), and quantity of money (3.355). Respondents' understanding about deposits (2,085), simple interest (2.35), compound interest (2.55), minimum balance (2.84), and loan interest (3.165) is medium. These findings support the preceding description of the respondents' characteristics: the majority (131) have a high financial literacy; 61 have a medium financial literacy; and 8 have a low financial literacy.

6.3. Items' validity and reliability

Cronbach's alpha, composite reliability, and rho A were computed to validate the internal consistency dependability of the three measures used in model 1 (Fornell & Larcker, 1981). Cronbach's alpha ranges from 0.826 to 0.930, which is greater than the acceptable level of 0.70 (Cronbach, 1951). The composite reliability ranges from 0.896 to 0.95, which is higher than the acceptable

Model 1									
	Lov	Low FLI Medium FLI		High					
Occupation	Male	Female	Male	Female	Male	Female	Total		
Teacher	0	0	0	0	2	5	7		
Housewives	0	1	0	11	1	43	56		
Government Officers	0	0	0	0	1	0	1		
Religion leaders	0	0	0	0	0	0	0		
Community Leaders	0	0	0	0	0	1	1		
Military/Police	0	0	0	0	0	0	0		
Private employee	0	0	0	0	0	0	0		
Entrepreneurs	0	0	0	1	2	0	3		
Farmer	5	2	35	14	53	23	132		
Others	0	0	0	0	0	0	0		
Total	5	3	35	26	59	72	200		

Table 7. Respondent characteristics in	employment,	gender, and financial literacy
	Model 1	

Table 8. Des	Table 8. Descriptive statistics of empirical indicators in model 1								
FL indicators	Mean	Min	Max	Std dev.	Model 1	Model 2			
Identity Requirement	4.39	0	5	1.486	High	High			
Amount of Money	3.355	0	5	2.243	High	High			
Minimum balance	2.84	0	5	2.151	Medium	High			
Time Deposit	2.085	0	5	1.891	Medium	Low			
Simple Interest	2.35	0	5	2.073	Medium	Low			
Compound Interest	2.55	0	5	2.041	Medium	Low			
Loan interest	3.165	0	5	1.961	Medium	High			
Price Discount	3.805	0	5	1.817	High	High			
Inflation	3.46	0	5	1.851	High	High			
Time value of money	3.765	0	5	2.009	High	High			
Money illusions	3.895	0	5	1.651	High	High			

Notes: Model 1: Mean 0-1.66 (Low); 1.67-3.33 (Medium); 3.34-5 (High).

Model 2: Mean 0-2.5 (Low); 2.6-5 (High).

level of 0.60 (Fornell & Larcker, 1981). Rho A ranges from 0.882 to 0.932, which is greater than the suggested threshold of 0.70 (Dijkstra & Henseler, 2015).

Latent variable	Reflective model	Outer loadings	Average variance extracted	Cronbach's alpha	Composite ratio	rho A
Financial	LK1 → Lit.	0.473	0.310	0.626	0.753	0.643
Literacy	LK2 → Lit.	0.539	-			
	LK3 → Lit.	0.554				
	LK4 → Lit.	0.544	-			
	LK5 → Lit.	0.704				
	LK6 → Lit.	0.629				
	LK7 → Lit.	0.398				
Governance	TK1 → Gov.	0.477	0.494	0.736	0.826	0.773
	TK2 → Gov.	0.703				
	TK3 → Gov.	0.694				
	TK4 → Gov.	0.814				
	TK5 → Gov.	0.778				
Sustainability	KK1 → Sus.	0.501	0.351	0.830	0.865	0.834
	KK2 → Sus.	0.523				
	KK3 → Sus.	0.632				
	KK4 → Sus.	0.570				
	KK5 → Sus.	0.560				
	KK6 → Sus.	0.529				
	KK7 → Sus.	0.576				
	KK8 → Sus.	0.656				
	KK9 → Sus.	0.739				
	KK10 → Sus.	0.627				
	KK11 → Sus.	0.530				
	KK12 → Sus.	0.625				

The average variance was extracted in convergent validity. The extracted average variance (AVE) ranges from 31% to 49.4%. It is less than the suggested level of 0.5. The extracted average variance would be a conservative assessment of the measurement model's validity. Even if error accounts for more than half of the variance, the researcher could claim only on composite reliability that the construct's convergent validity is acceptable. When AVE is less than 0.5 but composite reliability is greater than 0.6, the convergent validity is still valid (Fornell & Larcker, 1981; Lam, 2012). The outer loadings of the reflective model indicate that all coefficients are significant at the 0.01 level. It shows that the indicator reliability of all indicators supports the convergent validity (Lam, 2012). The bootstrapping was used for hypothesis testing until 5,000 subsamples were set. The outcomes support all hypotheses. Figure 3 shows the output o PLS-SEM analysis.

Table 10 shows a 0.01% probability of attaining a beta coefficient as high as 0.467. The regression weight of financial literacy in predicting governance significantly deviates from zero (two-tailed). We found a 0.01% possibility of attaining a beta coefficient as high as 0.317. The regression weight for financial literacy in predicting MFI sustainability considerably deviates from zero (two-tailed) at the 0.001 level. Similarly, there is a 0.01% possibility of achieving a beta coefficient as high as 0.550. The regression weight of governance in predicting MFI sustainability significantly deviates from zero at the 0.001 level (two-tailed). The findings prove the indirect and

Table 10. Hypothesis testing				
Path	В	Std. dev	T statistics	p Values
Financial Literacy → Governance	0.476	0.077	6.213	0.000***
Financial Literacy → Sustainability	0.317	0.088	3.618	0.000***
Governance → Sustainability	0.550	0.100	5.475	0.000***
Financial Literacy → Governance → Sustainability	0.262	0.058	4.519	0.000***
Sobel Test	Test S	Test Statistic	Std. Dev	p Values
Financial Literacy → Governance → Sustainability	4.1	4.109	0.064	0.000***
Noto: ***cianificant at 0 001 loval				

Notes: ***significant at 0.001 level.

mediating effect of governance in the relationship between financial literacy and MFI sustainability. Table 9 explains validity and reliability measurement.

6.4. Discussion and robustness check

The findings support all hypotheses. Financial literacy positively affects governance and MFIs sustainability. It is supported by Ye and Kulathunga (2019) that financial literacy is also vital to SMEs' sustainability in Sri Lanka. It has a direct effect on sustainability and also has an indirect effect through access to finance and financial risk attitude. It is reported that Chief Financial Officers (CFOs) who have a high level of financial literacy can make a significant contribution to the financial management of SMEs because CFOs with strong financial literacy skills are better able to analyze financial data, identify financial risk and opportunities, and make informed financial decisions that can benefit the SMEs. Financial literacy helps an organization improve their financial management practices and eliminates business failures.

The research shows that the impact of financial literacy on microfinance sustainability through microfinance governance is supported. It is in line with the findings in previous research (Ermawati et al., 2019; Sanistasya et al., 2019; Wahyono & Hutahayan, 2021). Managers with an adequate financial literacy drive a good performance and sustainability of MFIs. It also supports that a good governance is vital to MFI sustainability (Husna et al., 2019). This result is relevant to Kulathunga et al. (2020) in the context of enterprise risk management (ERM) practices. Kulathunga et al. (2020) found that financial literacy improves SME performance via ERM practices. Financial literacy can drive top managers to apply the new security and internal control systems in the organization. This results in increasing SME performance by avoiding fraud and errors. It is supported by Mutamimah et al. (2021) that the implementation of corporate governance in SMEs measured by transparency and accountability can reduce SMEs' credit risk. And it will be more effective to reduce credit risk when the managers have higher financial literacy: more knowledge, understanding, and skills in financial management. In the context of this study, the results show good governance plays a significant role that managers with higher financial literacy implement good governance to manage the MFIs, as a consequence, it results in enhancing MFIs' sustainability.

The findings show that the majority of respondents have a high financial literacy. A high level of financial literacy copes with some disadvantages (a lack of education, job availability, and work experience). The findings of Al-Tamimi and Kalli (2009) confirms that workplace activity, age and income level have impacted the level of financial literacy in United Arab Emirates. Moreover, heterogeneity of respondents' characteristics justifies the importance of considering age, gender, income level and education as evidenced by research in rural Tanzania (Lotto, 2020). Further research is needed to examine the contribution of financial literacy to society. The outcome is consistent with FGD findings: all respondents can choose a right option, when they decide an interest rate on loan. The existence of MFIs allows of a good financial literacy in rural area. Financial intermediary such as MFIs improves financial literacy and financial inclusion for the poor in rural Uganda (Bongomin et al., 2020). The government and other stakeholders must organize financial literacy program including financial management training.

A robustness check was performed to examine the sensitivity of the results (Tables 11–13). The average understanding about minimum balance and loan interest was changed from the medium understanding category in Model 1 to the high understanding category in Model 2. It is because Model 2 used only two classification categories. The outcome is in line with FGD findings: all respondents prefer a low interest rate on loan for lowering debts. The average understanding about deposit, simple interest and compound interest was changed from the medium understanding category in Model 1 to the low understanding category in Model 2. The findings in line with the research conducted in Russia where less than 50% of respondents understand inflation and compound interest rate concept (Klapper et al., 2013).

The low level of understanding is supported by the FGD findings: the majority of respondents were not familiar with non-bank financial services such as insurance, because their limited income precludes it. It suggests that 8 out of 11 financial literacy indicators are well grasped by respondents, while the remaining three are not. This might limit the choices of investment platform as researched by Lotto (2020) that household investment choices is significantly influenced by financial literacy. It is also evident from research conducted by Hastings and Tejeda-Ashton (2008) where the choice behavior of investment funds is affected by worker financial literacy. A robustness check clarifies characteristics of respondents with a low or high financial literacy. It also supports the findings. 117 out of 200 respondents have a high financial literacy, while 83 have a low financial literacy.

As summarized in Table 11, the distribution of high and medium literacy levels shifted mostly to low literacy levels. But, respondents with a high FLI are still dominated by men and women aged 41 and over. Interestingly, young respondents aged 21 to 25 who previously had a high FLI were switched to a low FLI. It proves the previous assumption that respondents' financial literacy is influenced by factors: limited employment availability, a low level of education, and work experience. It is supported by the FGD findings: respondents do not know how to make cash budget, although they realize the importance of it. Some respondents noted that local government rarely provides financial management training, and that it is mainly allocated for MFI management.

As demonstrated in Table 12, the robustness check shows that the majority of respondents with a high financial literacy category in model 1 was shifted to a low financial literacy category. But the ratio of respondents with a high level of financial literacy features a low education level. The ratio of respondents with a high FLI (no education records (9/15); primary school completion (18/26) and medium high school completion) exceeds the ratio of respondents with a high FLI (senior high school completion (27/49)). It suggests that local culture prompts male with an incomplete high school education to work for a living, and that it prompts female with an incomplete high school education to seek for further learning or to manage a household. The different results of literacy between gender is in line with the findings of Al-Tamimi and Kalli (2009) when studied the literacy among investors in United Arab Emirates.

Table 13 presents the robustness check in respondent occupation categories. Some with a high financial literacy in Model 1 were shifted to a low financial literacy. But, as the original findings in Model 1, the ratio of housewife (40/56) with a high FLI is higher than that of famers (68/132). And male farmers have a lower literacy rate (47/93) than female farmers (21/39). It supports the

	Model 2								
	Low FLI		Higl						
Age	Male	Female	Male	Female	Total				
Below 20	3	2	3	1	9				
21-25	9	6	3	7	25				
26-30	7	4	5	9	25				
31-35	5	6	7	10	28				
36-40	5	2	11	12	30				
Above 41	17	17	24	25	83				
Total	46	37	53	64	200				

Table 11. Respondent characteristics in age, gender and financial literacy Model 2

Model 2							
	Low FLI		High FLI				
Education	Male	Female	Male	Female	Total		
No education	4	2	5	4	15		
Primary school drop out	23	12	17	12	64		
Primary school	3	5	8	10	26		
Junior High School	4	3	6	13	26		
Senior High School	9	13	10	17	49		
Diploma	1	0	2	5	8		
University	2	2	5	3	12		
Total	46	37	53	64	200		

Table 12. Resp	ondent characte	eristics in educa	tion, gender and	d financial litero	ісу	
		Mod	el 2			
	Low	FLI	High	n FLI		-
					1	

previous assumption: some types of work are not available for male, so that they engage themselves in women farmers group.

Younger individuals may have a more difficult time repaying loans, as they may not established loan histories or stable incomes. Whereas individuals with higher levels of education may have better financial literacy and be better equipped to manage their finances, including loan repayment. In addition, individuals with stable, well-paying jobs are more likely to be able to repay loans on time. In summary, age, education and employment can impact microfinance sustainability. MFIs that target older individuals, higher education levels and stable employment may have experience higher level of sustainability.

	Model 2							
	Low FLI		Hig	High FLI				
Occupation	Male	Female	Male	Female	Total			
Teacher	0	2	2	3	7			
Housewives	0	15	1	40	56			
Government Officers	0	0	1	0	1			
Religion leaders	0	0	0	0	0			
Community Leaders	0	1	0	0	1			
Military/Police	0	0	0	0	0			
Private employee	0	0	0	0	0			
Entrepreneurs	0	1	2	0	3			
Farmer	46	18	47	21	132			
Others	0	0	0	0	0			
Total	46	37	53	64	200			

Table 13. Respondent characteristics in employment, gender, and financial literacy	
Madal 2	

6.5. Concluding remarks

This research proves that financial literacy plays a vital role in the transformation of rural MFIs. The findings support assumptions that financial literacy has positive effect on the sustainability of MFIs either directly or indirectly via governance. By having adequate literacy, the presence of MFI managers and customers encourages better MFI management. A well-governed MFI is demonstrated by well-organized administration and professional financial management. This has a positive impact on MFIs such as financial stability and long-term sustainability. The description of the respondents suggests that the majority has a high financial literacy, although the results indicate that they have limitations with job availability, education level, and work experience. The findings help rural MFIs and policymakers to improve financial literacy of MFI managers and to support the transformation of rural MFIs.

The are some policy implications of this study. First, local government may create policies that promote financial inclusion. By collaborating with academics, local government may conduct research to identify the knowledge, skills, and behaviors that needed by microfinance institutions. Second, this research provides inputs for the development of policies and practices that support sustainable MFIs and financial inclusion.

Nonetheless, results of this research have limitation to be tackled in the future. This research only focuses on one Women Farmers Group (WFG). The findings cannot be exemplified for the circumstances in other areas. Sociocultural differences are important. WFG consists of middleaged women and elderly. But, many men and young people who are of working age in WFG. In future research, research sample should be improved, and diverse sociocultural dimensions of rural communities need to be considered.

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References

- Abreu, M., & Mendes, V. (2010). Financial literacy and portfolio diversification. *Quantitative Finance*, 10(5), 515–528. https://doi.org/10.1080/ 14697680902878105
- Agbola, F. W., Acupan, A., & Mahmood, A. (2017). Does microfinance reduce poverty? New evidence from Northeastern Mindanao, the Philippines. *Journal of Rural Studies*, 50, 159–171. https://doi.org/10.1016/j. irurstud.2016.11.005
- Agustin, A. F. (2011). Peran Lembaga Keuangan Mikro (LKM) terhadap kinerja ekonomi kabupaten jombang. Jurnal Ekonomi Pembangunan, 9(2), 225–242. https:// doi.org/10.22219/jep.v9i2.3676
- Akmal, H., & Saputra, Y. E. (2016). Analisis tingkat literasi keuangan. Jurnal Ekonomi Dan Bisnis Islam, 1(2), 236–244.
- Al-Tamimi, H. A. H., & Kalli, A. A. B. (2009). Financial literacy and investment decisions of UAE investors. *The Journal of Risk Finance*, 10(5), 500–516. https:// doi.org/10.1108/15265940911001402
- Ariadi, R., Malelak, M. I., & Astuti, D. (2015). Analisa hubungan financial literacy dan demografi dengan investasi, saving dan konsumsi. *FINESTA*, 3(2), 7–12.
- Atahau, A. D. R., Huruta, A. D., & Lee, C.-W. (2020). Rural microfinance sustainability: Does local wisdom driven governance work? *Journal of Cleaner Production*, 267, 1–10. https://doi.org/10.1016/j.jclepro.2020.122153
- Atahau, A. D. R., Sakti, I. M., Huruta, A. D., & Kim, M.-S. (2021). Gender and renewable energy integration: The mediating role of green-microfinance. *Journal of Cleaner Production*, 318, 128536. https://doi.org/10. 1016/j.jclepro.2021.128536
- Baidoo, S. T., Boateng, E., & Amponsah, M. (2018). Understanding the determinants of saving in Ghana: Does financial literacy matter? *Journal of International Development*, 30(5), 886–903. https:// doi.org/10.1002/jid.3377

- Baidoo, S. T., Yusif, H., Ayesu, E. K., & Mensi, W. (2020). Improving loan repayment in Ghana: Does financial literacy matter? *Cogent Economics & Finance*, 8(1), 1787693. https://doi.org/10.1080/23322039.2020. 1787693
- Bongomin, G. O. C., Munene, J. C., Yourougou, P., & McMillan, D. (2020). Examining the role of financial intermediaries in promoting financial literacy and financial inclusion among the poor in developing countries: Lessons from rural Uganda. Cogent Economics & Finance, 8(1), 1761274. https://doi.org/ 10.1080/23322039.2020.1761274
- Brickley, J. A., Coles, J. L., & Terry, R. L. (1994). Outside directors and the adoption of poison pills. *Journal of Financial Economics*, 35(3), 371–390. https://doi.org/ 10.1016/0304-405X9490038-8
- Brillianti, F., & Kautsar, A. (2020). Apakah literasi keuangan memengaruhi kesejahteraan rumah tangga di Indonesia? Kajian Ekonomi Dan Keuangan, 4(2), 103–115. https://doi.org/10.31685/kek.v4i2.541
- Byrd, J. W., & Hickman, K. A. (1992). Do outside directors monitor managers? Journal of Financial Economics, 32(2), 195–221. https://doi.org/10.1016/0304-405X9290018-S
- Central Bureau of Statistics. (2020). Persentase penduduk miskin menurut provinsi (Persen) tahun 2019-2020. Retrieved from: https://www.bps.go.id/indicator/23/ 192/1/persentase-penduduk-miskinmenurutprovinsi.html
- Chenuos, N. K., Mohamed, A., & Bitok, S. K. (2014). Effects of corporate governance on micro finance institutions financial sustainability in Kenya. European Journal of Business and Management, 6(30), 71–81.
- Chirambo, D. (2017). Enhancing climate change resilience through microfinance: Redefining the climate finance paradigm to promote inclusive growth in Africa. *Journal of Developing Societies*, 33(1), 150–173. https://doi.org/10.1177/0169796X17692474
- Cohen, J. (1992). A power primer. Psychological Bulletin, 112(1), 155–159. https://doi.org/10.1037/0033-2909. 112.1.155
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297–334. https://doi.org/10.1007/BF02310555
- Cull, R., Demirgüç-Kunt, A., & Morduch, J. (2007). Financial performance and outreach: A global analysis of leading microbanks. *The Economic Journal*, 117(517), 107–133. https://doi.org/10.1111/j.1468-0297.2007.02017.x
- Dijkstra, T. K., & Henseler, J. (2015). Consistent partial least squares path modeling. *MIS Quarterly*, 39(2), 297–316. https://doi.org/10.25300/MISQ/2015/39.2.02
- Effendi, J. (2010). Mengembangkan lembaga keuangan mikro syariah. Iqtishodia: Jurnal Ekonomi Islam Republika, 4(3), 1.
- Ermawati, L., Fitri, A., & Thoriq, M. (2019). Pengaruh literasi keuangan terhadap kinerja keuangan koperasi pegawai negeri di Bandar Lampung, perilaku pengelolaan keuangan pengurus koperasi sebagai variabel intervening. *Creative Research Management Journal*, 2(1), 60. https://doi.org/10.32663/crmj.v2i1.853
- Ferdinand, A. (2014). *Metode penelitian manajemen*. Universitas Dipenogoro Press.
- Financial Authority Services. (2019). Survei Nasional Literasi dan Inklusi Keuangan (SNLIK) tahun 2019 (Financial Authority Services Publishing).
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39. https://doi.org/10.1177/ 002224378101800104

- Hastings, J., & Tejeda-Ashton, L. (2008). Financial literacy, information, and demand elasticity: Survey and experimental evidence from Mexico. https://doi.org/ 10.3386/w14538
- Husna, M., Puteri, H. E., & Winarno, W. (2019). Determinan sustainabilitas lembaga keuangan mikro syariah dan upaya penanggulangan kemiskinan di Kabupaten Agam. Jurnal Ekonomika Syariah, 3(2), 61–74. https:// doi.org/10.30983/es.v3i2.2556
- Klapper, L., Lusardi, A., & Panos, G. A. (2013). Financial literacy and its consequences: Evidence from Russia during the financial crisis. *Journal of Banking & Finance*, 37(10), 3904–3923. https://doi.org/10.1016/j. jbankfin.2013.07.014
- Kulathunga, K. M. M. C. B., Ye, J., Sharma, S., & Weerathunga, P. R. (2020). How does technological and financial literacy influence SME performance: Mediating role of ERM practices. *Information*, 11(6), 297–317. https://doi.org/10.3390/info11060297
- Lam, L. W. (2012). Impact of competitiveness on salespeople's commitment and performance. *Journal of Business Research*, 65(9), 1328–1334. https://doi.org/ 10.1016/j.jbusres.2011.10.026
- Lee, C.-W., & Huruta, A. D. (2022). Green microfinance and women's empowerment: Why does financial fiteracy matter? Sustainability, 14(5), 3130. https://doi.org/10. 3390/su14053130
- Lewis, J. L., & Sheppard, S. R. J. (2006). Culture and communication: Can landscape visualization improve forest management consultation with indigenous communities? *Landscape and Urban Planning*, 77(3), 291–313. https://doi. org/10.1016/j.landurbplan.2005.04.004
- Lotto, J. (2020). Towards improving households' investment choices in Tanzania: Does financial literacy really matter? International Journal of Financial Studies, 8(2), 29–38. https://doi.org/10.3390/ ijfs8020029
- Lusardi, A. (2015). Financial literacy: Do people know the ABCs of finance? *Public Understanding of Science*, 24 (3), 260–271. https://doi.org/10.1177/ 0963662514564516
- Lusardi, A., & Mitchell, O. (2009). How ordinary consumers make complex economic decisions: Financial literacy and retirement readiness. https://doi.org/10.3386/w15350
- Lusardi, A., & Mitchell, O. S. (2011). Financial literacy and retirement planning in the United States. *Journal of Pension Economics and Finance*, 10(4), 509–525. https://doi.org/10.1017/S147474721100045X
- Lusardi, A., & Scheresberg, C. D. B. (2013). Financial literacy and high-cost borrowing in the United States. https://doi.org/10.3386/w18969
- Lusardi, A., & Tufano, P. (2015). Debt literacy, financial experiences, and overindebtedness. *Journal of Pension Economics and Finance*, 14(4), 332–368. https://doi.org/10.1017/S1474747215000232
- Maarten, C. J., van, R., & Lusardi, A. (2012). Financial literacy, retirement planning, and households wealth. The Economic Journal, 122(560), 449–478. https://doi.org/10.1111/j.1468-0297.2012.02501.x
- Morgan, P. J., & Pontines, V. (2014). Financial stability and financial inclusion. SSRN Electronic Journal, (448). https://doi.org/10.2139/ssrn.2464018
- Moser, R. M. B., & Gonzalez, L. (2016). Green microfinance: A new frontier to inclusive financial services. Revista de Administração de Empresas, 56(2), 242–250. https://doi.org/10.1590/S0034-759020160209
- Mutamimah, M., Tholib, M., & Robiyanto, R. (2021). Corporate governance, credit risk, and financial literacy for small medium enterprise in Indonesia.

Business: Theory and Practice, 22(2), 406–413. https:// doi.org/10.3846/btp.2021.13063

- OECD. (2013). PISA 2012 financial literacy assessment framework: Assesment and analytical framework. OECD Publishing.
- OECD INFE. (2011). Measuring Financial Literacy: Core Questionnaire in Measuring Financial Literacy: Questionnaire and Guidance Notes for Conducting an Internationally Comparable Survey of Financial Literacy. https://www.oecd.org/finance/financialeducation/49319977.pdf
- Prasad, E. (2010). Financial sector regulation and reforms in emerging markets: An overview. https://doi.org/10. 3386/w16428
- Robinson, M. S. (2002). The microfinance revolution: Volume 2. Lessons from Indonesia. World Bank. https:// openknowledge.worldbank.org/handle/10986/14254
- Sanistasya, P. A., Raharjo, K., & Iqbal, M. (2019). The effect of financial literacy and financial inclusion on small enterprises performance in East Kalimantan. Jurnal Economia, 15(1), 48–59. https://doi.org/10.21831/ economia.v15i1.23192
- Setyahadi, R. R., & Narsa, I. M. (2020). Corporate governance and sustainability in Indonesia. The Journal of Asian Finance, Economics & Business, 7(18), 885–894. https://doi.org/10.13106/jafeb.2020.vol7.no12.885
- Sim, J., & Prabhu, V. V. (2014). The sustainability and outreach of microfinance institutions. In B. Grabot, B. Vallespir, S. Gomes, A. Bouras, & D. Kiritsis (Eds.), Advances in Production Management Systems. Innovative and Knowledge-Based Production Management in a Global-Local World. APMS 2014.

IFIP Advances in Information and Communication Technology (pp. 286–293). Springer. https://doi.org/ 10.1007/978-3-662-44736-9_35

- Soegiono, L., Atahau, A. D. R., Harijono, H., Huruta, A. D., & Tvaronavičienė, M. (2019). Local wisdom in rural microfinance: A descriptive study on villagers of East Sumba. Entrepreneurship & Sustainability Issues, 6(3), 1485–1496. https://doi.org/10.9770/ jesi.2019.6.3(30)
- The Asia Fondation. (2003). Microfinance service in Indonesia: Survey of institutions in 6 provinces. Jakarta The Asia Foundation.
- Tongco, M. D. C. (2007). Purposive sampling as a tool for informant selection. *Ethnobotany Research and Applications*, 5, 147–158. https://doi.org/10.17348/ era.5.0.147-158
- Wahyono, W., & Hutahayan, B. (2021). The relationships between market orientation, learning orientation, financial literacy, on the knowledge competence, innovation, and performance of small and medium textile industries in Java and Bali. Asia Pacific Management Review, 26(1), 39–46. https://doi.org/10.1016/j.apmrv.2020.07. 001
- Yang, B., & Lester, D. (2016). Validating the executive personal finance scale with financial investments and expectations in university students. *Psychological Reports*, 118(3), 804–809. https://doi. org/10.1177/0033294115625581
- Ye, J., & Kulathunga, K. (2019). How does financial literacy promote sustainability in SMEs? A developing country perspective. Sustainability, 11(10), 2990. https://doi. org/10.3390/su11102990

Appendix Questionnaire

This questionnaire aims to measure the financial literacy of members and administrators of microfinance institutions. Furthermore, this research intends to explore respondent's opinion regarding the link between financial literacy, microfinance institution governance and sustainability.

We appreciate your participation in this research. All information provided will be kept confidential and will only be used for research purposes.

Questionnaire filling instructions

- (1) Fill in the answers in black ink/ballpoint (not in pencil)
- (2) Put a cross (X) on the answer that you think is most appropriate
- (3) Each question requires only one answer.

Information:

- (1) SD = Strongly Disagree
- (2) D = Disagree
- (3) N = Neutral
- (4) A = Agree
- (5) SA = Strongly Agree

1. Interview Date [dd/mm/yyyy]	
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GENERAL INFORMATION

Purpose: to obtain data about the general characteristics of respondents

2. Name of respondent: Fill in the respondent's number code based on the order of the interview (001 etc.)	
3. Village/Address:	
4. Subdistrict:	
5. Regency/city:	
6. Respondent's age:	
7. Gender: 1 = Male 2 = Female	
 8. Religion and Beliefs: 1 = Protestant 2 = Catholic 3 = Islam 4 = Hindu 5 = Buddha 6 = Other beliefs, Mention 	

(Continued)

(Continued)	
9. Highest level of education completed: 1 = Never attended school 2 = Did not finish elementary school 3 = Graduated from Elementary School (SD) 4 = Completed high school (SLTP/SMP/equivalent) 5 = Graduated from high school (SMA/SMK/equivalent) 6 = Graduated from Academy (D3/D2/D1) 7 = Graduated from Bachelor (S1)	
10. Engagement in Microfinance: 1 = Yes, as a member 2 = Yes, as administrator 3 = Not involved yet	
 11. If you answered Yes to number 10, when did you start getting involved in Microfinance? 1 = Prior to 2000, state the year 2 = After 2000, state the year 	
12. Work: 1 = Teacher 2 = Housewife 3 = State civil apparatus 4 = Religious leaders 5 = Public figure 6 = TNI/POLRI 7 = Private employees 8 = Self-employed 9 = Farmer 10 = Other, Mention	
13. Years worked:	years
14. Monthly Income, 1 = Less than Rp. 1 Million, Mention 2 = Rp. 1 Million—Less than Rp. 2 Million, Mention 3 = Rp. 2 Million—Less than Rp. 4 Million, Mention 4 = Rp. 4 Million—Less than Rp. 6 Million, Mention 5 = Rp. 6 Million—Less than Rp. 8 Million, Mention 6 = Rp. 8 Million—Less than Rp. 10 Million, Mention 7 = Above Rp. 10 Million, Mention	
 15. Current assets: 1 = Animals/Livestock, Total:heads 2 = Land, Area:M 2/Hectare 3 = Building, Area:M 2 4 = Garden, Area:M 2/Hectare 5 = Vehicles, Please specify 6 = Others, Specify 	
 16. Financial Product Ownership: 1 = Savings account at the bank 2 = Deposit account at the bank 3 = Savings account at a non-bank financial institution (LKNB) 4 = Deposit accounts at non-bank financial institutions (LKNB) 5 = Insurance and or unit link 6 = Lottery club 7 = Doos pat have any financial products 	

7 = Does not have any financial products

8 = Others, Specify

Code	Variable	Question	Answer	
E.1	Identity Requirements	Do you need an identity card (KTP/SIM) to open a savings account at the bank?	1. Yes 2. No 3. I don't know Reason:	
E.2	Minimum amount of money to open a savings account	Do you have to deposit a certain amount of money as an initial deposit to set up a savings account at the bank?	1. Yes 2. No 3. I don't know Reason:	
E.3	Minimum balance in savings account	Is there a minimum fund that must be deposited in a savings account (non- withdrawable)?	1. Yes 2. No 3. I don't know Reason:	
E.4	Deposits guaranteed by the government	If the bank where you save goes bankrupt, are your savings guaranteed by the government?	1. Yes 2. No 3. I don't know Reason:	
E.5	Simple Interest	For example, you have a savings of IDR 1,000,000 with an interest of 4% per year (assuming there are no administration fees, no depositing/withdrawing savings), then exactly 1 year later, will the amount of money in your savings increase?	1. Yes 2. No 3. I don't know Reason:	
E.6	Compound interest For example, you have a savings of Rp. 1,000,000 with an interest of 4% per year (assuming there are no administration fees, no depositing/withdrawing savings), then exactly 2 years later, will the amount of money in your savings experience a greater increase compared to the increase in the previous year? First?		1. Yes 2. No 3. I don't know Reason:	
E.7	Calculating loan interest For example, you apply for a bank loan of Rp. 1,000,000 with a loan term of 1 year and an interest of 5% per year, then you will spend Rp. 1,050,000 to pay off the loan.		1. Yes 2. No 3. I don't know Reason:	
E. 8	Discounted Price (Discount)	When you want to shop for household needs, you prefer to shop at Store A, which offers a 20% discount on the initial price of IDR 1,000,000, compared to buying the same product and price at Store B with a discount of IDR 100,000.	1. Yes 2. No 3. I don't know Reason:	

(Continued)

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Code	Variable	Question	Answer
E. 9	Inflation	You have savings of IDR 1,000,000 with an interest rate of 1% per year and an inflation rate of 2%. If the savings are used today, it can be used to buy 50 kinds of household goods. However, one year later, if the savings were spent, it would only be enough to buy less than 50 of the same items as before.	1. Yes 2. No 3. I don't know Reason:
E.10	Time value of money	You choose between earning Rp. 10000,000 today, compared to getting Rp. 10000,000 in 5 years.	1. Yes 2. No 3. I don't know Reason:
E.11	Money illusion	If your income doubles next year and the prices of all goods double, then the amount of goods you can buy next year will be less than the previous year.	1. Yes 2. No 3. I don't know Reason:

1. Knowledge Aspect in Financial Literacy

No.	Statement	SA	Α	Ν	D	SD
LK1	In my opinion, looking for a loan with low interest will benefit my business					
LK2	I think it's important to set aside money for contingencies					
LK3	In my opinion, protecting yourself from the risk of accidents, etc. can be done by buying a life insurance policy					
LK4	In my opinion, incoming money will be recorded on the debit side and outgoing money will be recorded on the credit side					
LK5	In my opinion, making a cash budget is important to determine priorities for the use of funds					
LK6	In my opinion, saving money in several types of assets will reduce the risk of loss					
LK7	In my opinion, a bank is a financial institution that serves the deposit and lending of money as well as carrying out payment functions					

2. Financial Literacy

No.	Statement	SA	Α	Ν	D	SD
TK1	Managers of microfinance institutions manage finances in a professional manner					
TK2	Microfinance institutions monitor the financial condition of members					
TK3	Microfinance institutions have orderly administration					
TK4	Microfinance institutions help finding solutions for members facing financial problems					
TK5	Microfinance institutions select administrators based on competence					

3. Governance

No.	Statement	SA	Α	Ν	D	SD
KK1	Microfinance institutions channel funds according to the needs of members					
KK2	The business of microfinance institutions is useful for improving the economies of its members					
KK3	Microfinance institutions carry out management principles according to local culture					
KK4	Microfinance institutions have skilled administrators					
KK5	Microfinance institutions have access to adequate sources of funds					
KK6	Microfinance institutions have the opportunity to develop businesses to increase the economic capacity of their members					
KK7	Microfinance institutions provide soft loans for environmentally conscious businesses					
KK8	Microfinance institutions provide lighter credit terms for businesses that care about the environment					
КК9	Microfinance institutions do business efficiently to reduce wastage of resources					
KK10	Microfinance institutions participate in campaign to reduce land burning					
KK11	Microfinance institutions encourage the usage of used goods in their activities (used paper for envelopes, etc.)					
KK12	Microfinance institutions support recycling activities					

4. Microfinance Sustainability

No.	Statement	SA	Α	Ν	D	SD
FA1	I want to know more about money management					
FA2	I feel more satisfied spending money than saving it for the long term					
FA3	I know how to manage money					
FA4	I am ready to risk some of my own money to save or invest					
FA5	I am interested in reading and learning more about financial literacy					
FA6	I think money is available to spend					
FA7	I can control my financial situation					
FA8	I read to increase my knowledge in finance					

5 . Financial Attitude

No.	Statement	SA	Α	N	D	SD
FB1	Before I buy something, I consider carefully whether I can afford it					
FB2	I put a close attention to my personal financial affairs					
FB3	I think make a saving plan is important					
FB4	I (We) pay our bills on time					
FB5	I (We) create a plan to manage our revenue					
FB6	I (We) create a plan to manage our investments					
FB7	I (We) plan our expenses					
FB8	I (We) control whether income and expenses are within budget					

6. Financial Behavior

No.	Statement	SA	Α	Ν	D	SD
FK1	A high return investment tends to have a high risk					
FK2	If someone offers you the opportunity to make a lot of money, you will likely loose a lot of money too					
FK3	The high price of goods causes the cost of living to increase rapidly					
FK4	Apart from saving at the bank, I bought assets such as land, horses, cows, buffaloes, pigs and so on					
FK5	It is unlikely that you will lose all your money if you diversify it					
FK6	Saving in a bank is safe and risk free					
FK7	If prices rise rapidly, the money people have in savings accounts will lose its value					

7. Financial Knowledge

FGD Questions:

- (1) Is looking for a low interest loan benefit my business?
- (2) Is it important to set aside money for unforeseen needs?
- (3) Do you protect yourself from the risk of accidents by buying a life insurance policy?

- (4) Does incoming money be recorded on the debit side and outgoing money will be recorded on the credit side?
- (5) Is making a cash budget important to determine priorities for the use of funds?
- (6) Does saving money on several types of assets reduce the risk of loss?
- (7) Does the microfinance institution regularly provide training for members on microfinance management?
- (8) Does the government, through related agencies, always providing an assistance to microfinance institutions?