Article

Green Microfinance and Women's Empowerment: Why Does Financial Literacy Matter?

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Abstract: This study investigated the role of financial literacy in the relationship between women's empowerment and green microfinance. We set a conceptual model with green microfinance as an outcome variable, financial literacy as a mediating variable, and women's empowerment as an exposure variable. Variance-based SEM was employed for analysis. The results show that the exposure and mediating variables have a significant direct and indirect impact on the outcome variable. The relationship between women's empowerment and green microfinance is partially mediated by financial literacy. Local wisdom-based financial literacy is found to be an alternative for mainstreaming women's empowerment in local development. In addition, gender-targeted programs need to consider pro-literacy policies for achieving green microfinance sustainability. By using financial literacy as a mediating variable, this study contributes to the current literature on the relationship between women's empowerment and green microfinance.

Keywords: green microfinance; women's empowerment; financial literacy; mediation

1. Introduction

Microfinance is a viable alternative to poverty alleviation in rural areas, and has been examined by many academic researchers [1–13]. The lack of access to formal financial services experienced by rural communities with limitations is the driving factor for researching rural microfinance [1–5,9–13]. For example, eradicating poverty and attaining women empowerment is impossible when two thirds of adults worldwide are financially illiterate, and women continue to lag behind males in the financial decision-making [14]. Microfinance institutions (MFIs) have been identified as organizations that can help developing economies achieve social concerns. MFIs help people at the bottom of the pyramid improve their economic opportunities and living conditions [15,16]. Women have fewer options for getting out of poverty, making them more dependent on microfinance [17]. Financial literacy is a major success in achieving at least nine of the seventeen Sustainable Development Goals (SDGs), although financial illiteracy affects everyone; women, low-income people, and those with less education experience significant disparities in financial literacy [14].

Several previous research studies have used a quantitative approach to evaluate the relationships between microfinance, financial literacy, and women's empowerment [1,2,11–13,18–20]. The development of microfinance, financial literacy, and women's empowerment has been studied extensively during the last two decades [3–5]. Nowadays, more comprehensive studies concerning the relationship between microfinance, women's empowerment, and financial literacy have been explored [9,11]. Instead of focusing on the relationship between microfinance, financial literacy, and women's empowerment, this study examines the role

of financial literacy as a mediating factor in the association between women's empowerment and green microfinance. Our study adopted the concept of green microfinance. Microfinance and climate change are two a priori distinct concepts that have been combined to develop green microfinance [21].

A recent study by Atahau et al. highlighted the way that green microfinance in East Sumba mediates the nexus between renewable energy and women's empowerment [2]. The findings of prior studies [1,2] were used to explain the development of microfinance and the rural community's economic and social conditions. As stated by Atahau et al., green MFIs in East Sumba supported climate action (SDG 13) and women's empowerment (SDG 5) [2]. When combined with financial literacy, microfinance could empower women [9,11]. Based on previous research [1,2,9,11], we expect that promoting financial inclusion (SDG 4) will support pro-climate (SDG 13) and pro-women's empowerment (SDG 5) policies in East Sumba.

The sections of this paper are arranged as follows: Section 2 explains a brief review of the existing literature; Section 3 elaborates the data and study design; Section 4 presents the empirical results; Section 5 presents the discussion; and Section 6 illustrates conclusions, including policy and theoretical suggestions, methodological implications, limitations, and suggestions for future research.

2. Literature Review and Hypothesis Development

2.1. Women's Empowerment and Financial Literacy

Recently, several academic researchers have emphasized the link between women's empowerment and financial literacy [9,11]. Women can improve their financial literacy by participating in training programs offered by the government and MFIs [11]. These initiatives are intended to boost women's educational engagement and improve their public sector performance [22]. The participation of microfinance is insufficient to empower women unless linked with education [12]. Throughout the COVID-19 pandemic, the effects on women's ability to overcome the financial shock have been disproportionate [23]. Therefore, women who utilize payment, savings, credit, and risk management products need to be financially literate [24]. The financial literacy of female entrepreneurs determines their success in establishing rural entrepreneurship [2]. Domestic and international prosperity will follow if women have equal access to education, job opportunities, financial resources, and representation in economic and political decision-making processes [9,10,25]. Women's economic empowerment is critical for recognizing women's rights and achieving larger developmental goals such as poverty reduction, education, economic growth, health, and welfare [26]. In short, several researchers have previously investigated the impacts of financial literacy on women's empowerment.

Research on how women's empowerment impacts their financial literacy remains limited. For this reason, we suggest a different route to accommodate the impact of women's empowerment on financial literacy. In our viewpoint, women must be empowered in order to manage their households and local group initiatives. After being empowered, they can learn to enhance their financial literacy through both formal education and their own local knowledge [27]. To empower women in rural areas, a bottom-up approach based on local wisdom has been implemented [28]. This women's farming group's initiatives appear to be effective because they are able to survive and grow in terms of both membership and managed funds. The value of their local wisdom increases their financial literacy through saving and loans activities. Therefore, this study proposes the following hypothesis:

Hypothesis 1 (H1). *Women's empowerment has a positive effect on financial literacy.*

2.2. Financial Literacy and Green Microfinance

This present study has already shown a link between having adequate financial literacy and the possibility of receiving microfinancing services [9,10,24]. Green microfinance, which incorporates all microfinance activities to meet the impact of climate change, promotes

the concept of green financing [29]. Entering the green finance sector opens up both new possibilities and rewards and encompasses challenges. Most microfinance institutions are inexperienced in this line of business, which necessitates modifications in administrative and operational requirements, financial products, and credit evaluation techniques [30]. The basic principles of financial literacy and possible links to microfinance access are complicated procedures. Women who are not familiar with green finance procedures perceive them as complicated and difficult to enter at this time. To obtain the microfinancial services such as microcredit, microinsurance, and loans in kind, women must be financially literate [9]. Thus, the following a hypothesis that can be proposed:

Hypothesis 2 (H2). *Financial literacy has a positive effect on green microfinance.*

2.3. Women's Empowerment and Green Microfinance

Women's empowerment is one of the pillars of a peaceful, wealthy, and sustainable world [31]. It is a part of the fifth SDG goal. Grameen Bank's success is linked to women's empowerment through microfinance institutions which provide micro-savings and loans [3]. These MFIs can be utilized as a transmission channel for sponsors to reach millions of the poorest populations worldwide who are most vulnerable to the effects of climate change [32,33]. Green MFIs play an intermediary role in distributing resources to millions of poor people, particularly women [21,32,33]. Several sponsors are committed to aiding MFIs in achieving sustainable development through green microfinance [29]. Such aid will assist MFIs in the development of green finance products. Indeed, the sponsors encourage green products by hosting financial literacy activities and providing technical and commercial advice [29]. MFIs and similar entities have evolved into important tools for empowering women by offering microfinancing services [9]. For this reason, this study proposes the following hypothesis:

Hypothesis 3 (H3). *Women's Empowerment has a positive effect on green microfinance.*

2.4. Women's Empowerment, Green Microfinance, and Financial Literacy

Financial literacy, together with microfinance, has tended to focus on the larger picture rather than on how financial literacy improves access to microfinance services [9]. Women's financial access is limited in numerous ways due to a lack of financial literacy [34]. Climate change, natural disasters, and green microfinance are used to promote microfinance programs that encourage sustainable activity [8]. Microfinance institutions offer various green products to finance their clients' green activities. The objective is to increase saving groups' access to microcredit [29]. According to a recent study by Lindahl and Mokvist, financial literacy benefits women's access to microfinance in developing countries [9]. Financial literacy is more important than credit access, and all future microfinance programs should emphasize it [11]. Microfinance could effectively empower women by improving their economic position and power relationships, although only when accompanied by the financial literacy [11]. Women's empowerment and access to microfinance are both influenced by financial literacy [9]. Considering its link to women's empowerment and green microfinance, we believe that financial literacy can have a significantly impact. As a result, the following hypothesis is proposed by this study:

Hypothesis 4 (H4). *Financial literacy mediates the relationship between women's empowerment and green microfinance.*

Figure 1 depicts the framework for mediation of the relationship between women's empowerment and green microfinance practices in East Sumba via financial literacy.
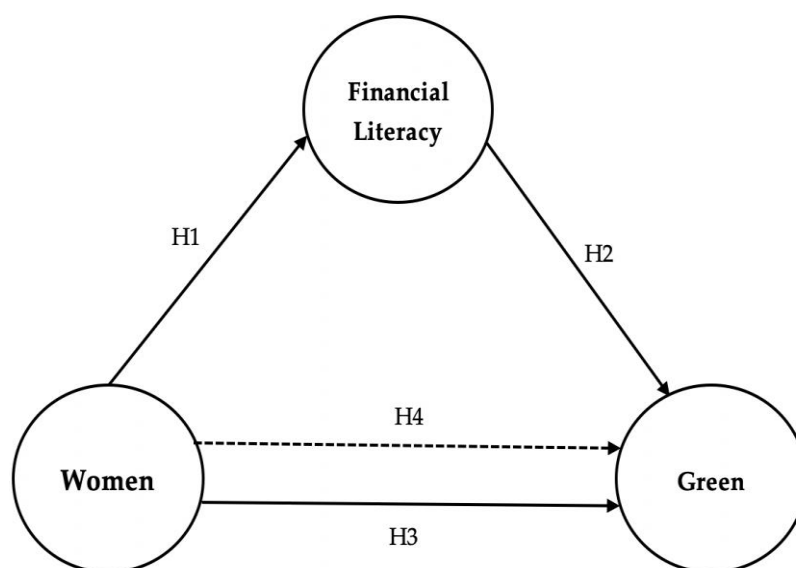
Figure 1. Research framework.

3. Methods

The data used in this study were collected from women's farming groups in East Sumba, East Nusa Tenggara, Indonesia. As stated by to Atahau et al., the Tapa Walla Badi women's farming groups make up a rural MFI that has operated for over two decades in East Sumba [1,2]. Sumba is a well-known island where several domestic (e.g., the Ministry of Energy and Mineral Resources) and international (e.g., the Asian Development Bank) stakeholders work together to accomplish collaborative programs [35].

To obtain the sample, we used purposive sampling. The sample size was chosen based on the partial least squares structural equation model (PLS-SEM) sample size requirement [36]. The most important factors in determining the sample size were statistical power and pointing arrows [37]. With an 80% statistical power (coefficient of determination at least 0.5; probability of error 1%) and four pointing arrows (including indirect arrow), the minimal sample size was 58. In a first phase from January to March 2021, we distributed questionnaires to survey. This study's target population consisted of 100 respondents. We discontinued 80 samples because around 20% of the responses were missing. As we had male respondents in the survey, it was thought better to exclude the nine male respondents from the survey results. Therefore, we ended up with 71 female respondents from the survey for data analysis purposes. In the second phase, a number of focus group discussions (FGDs) were arranged to examine the MFI members' perception in a local government plan to enhance financial inclusion in managing green MFIs. Seven participants were invited: five members of the women's microfinance group, a local government officer, and a local spokesperson (the Sumbanese called him "Wunang"), all of whom agreed to take part in the FGD phase. As the Sumbanese were more comfortable discussing communally in groups, FGDs were implemented in order to obtain more detailed information. FGDs were held in an open place in the village (at the home of the leader of the women's group) where they regularly gathered for group meetings. The FGDs were held for about two hours. This strategy allowed the researchers to obtain more in-depth information about women's empowerment, financial inclusion, and green microfinance implementation. In addition, we considered the health protocols for COVID-19 prevention, such as social distancing, during the FGD sessions.

Furthermore, we used a bootstrapping technique to investigate direct and indirect effects [38]. This process was repeated until we obtained 5000 subsamples. For the data analysis, SmartPLS 3 software was utilized. We adjusted our analysis results using the Sobel test for the significance of mediation (including mediation proportion, ab/c) [39].

We used a 5-point Likert scale to assess indicators. As stated in Table 1, its measuring indicators were set to measure each latent (component).

Table 1. Components and indicators.

Component	Code	Indicators
Women	Women1	Women's economic engagement in MFIs increases as their financial literacy improves.
	Women2	After gaining adequate financial literacy, women play an important part in MFI decision-making.
	Women3	The members of MFIs who have good financial literacy can earn more money.
	Women4	Increased financial participation by women due to improved financial knowledge can help MFIs grow.
	Women5	MFIs' financial capability can be increased by increasing the income of their female members.
Literacy	Literacy1	My business will be benefitted by a low-interest loan.
	Literacy2	It is necessary to set up funds for unplanned expenses.
	Literacy3	Purchasing life insurance will protect you from the risk of accidents and other disasters.
	Literacy4	The debit side records incoming funds, while the credit side records outgoing funds.
	Literacy5	Making a financial budget is important for determining funding priorities.
	Literacy6	Saving money in a variety of assets reduces the risk of losing money.
Green	Green1	MFIs offer soft loans for eco-friendly businesses.
	Green2	Live pharmacy is encouraged by MFIs.
	Green3	MFI members follow the principle of affordability by performing tasks efficiently.
	Green4	MFIs help to reduce grassland and forest fires.
	Green5	In MFIs, utensils are used repeatedly.
	Green6	MFIs have a recycling policy.

Note: Women's empowerment and green microfinance indicators are modified from [1,2].

Each latent (component) was included in the research framework. These indicators were assigned to the component that corresponded to them. We used five indicators for women's empowerment, six indicators for financial literacy, and six indicators for green microfinance. Therefore, three equations were derived from our research framework (shown in the last part of the literature review), as follows:

$$\text{Green Microfinance} = \alpha_1 + \text{c Women's Empowerment} + \varepsilon_1 \tag{1}$$

$$\text{Financial Literacy} = \alpha_2 + \text{a Women's Empowerment} + \varepsilon_2 \tag{2}$$

$$\text{Green Microfinance} = \alpha_3 + \text{c' Women's Empowerment} + \text{b Financial Literacy} + \varepsilon_3 \tag{3}$$

Two procedures were undertaken in order to analyze the data. The first step was to conduct a reflective measurement evaluation. The second step consisted of testing the hypotheses testing. The reflective measurement included an internal consistency reliability check, a convergent validity test, and a discriminant validity test. The internal consistency was measured by Cronbach's alpha [40], rho A [41], and composite reliability [42]. The convergent validity dealt with the outer loadings [36] and average variance extracted [43]. The Heterotrait–Monotrait (HTMT) ratio of correlations [44] determined the discriminant validity.

4. Results

This research employed seventy-one female respondents from the women's farming groups. Most of the respondents were more than 40 years of age. The majority of the women were farmers, as shown in Table 2.

Table 2. Respondents' characteristics.

No.	Demographic Factor	Frequency	%
1	Gender		
	Female	71	100.0
2	Age		
	21–25 years old	15	21.1
	26–30 years old	6	8.5
	31–35 years old	13	18.3
	36–40 years old	7	9.9
	>40 years old	30	42.3
3	Education		
	No education	24	33.8
	Elementary school	16	22.5
	Junior high school	12	16.9
	Senior high school	17	23.9
	Bachelor	2	2.8
4	Occupation		
	Teacher	1	1.4
	Housewife	25	35.2
	Entrepreneur	3	4.2
	Farmer	42	59.2
5	Monthly income		
	<US$200	-	-
	≥US$200–500	68	95.8
	>US$500	3	4.2

Source: Authors' calculation.

The respondents' small incomes and lack of educational background became a fit target for the survey. This was not surprising, because the informal sector is an alternative for workers with limited education levels. Furthermore, the internal consistency and convergent and discriminant validity met the requirements.

All components met the convergent validity and internal consistency criteria, as shown in Table 3. The convergent validity is be indicated by an AVE value of higher than 0.5. The composite reliability (CR), Cronbach's alpha (CA), and rho_A are all higher than 0.7. In addition, the values of the outer loadings between a component and its indicators are all higher than 0.6. This implies that the reliability of all indicators supports their convergent validity. Further, the discriminant validity of HTMT is demonstrated in Table 4.

Table 3. Internal consistency and convergent and discriminant validity.

Component	AVE	CR	CA	rho_A	Reflective Model	Outer Loadings
Women's Empowerment	0.613	0.885	0.835	0.868	Women1 ← Women	0.878
					Women2 ← Women	0.881
					Women3 ← Women	0.867
					Women4 ← Women	0.670
					Women5 ← Women	0.566
Green Microfinance	0.630	0.909	0.879	0.906	Green1 ← Green	0.727
					Green2 ← Green	0.662
					Green3 ← Green	0.655
					Green4 ← Green	0.882
					Green5 ← Green	0.904
					Green6 ← Green	0.890
Financial Literacy	0.519	0.864	0.833	0.895	Literacy1 ← Literacy	0.799
					Literacy2 ← Literacy	0.855
					Literacy3 ← Literacy	0.695
					Literacy4 ← Literacy	0.628
					Literacy5 ← Literacy	0.708
					Literacy6 ← Literacy	0.604

Source: Authors' calculation.

Table 4. Discriminant validity.

HTMT	Original Sample	Bias	2.5%	97.5%
Green → Literacy	0.791	0.009	0.686	0.878
Women → Literacy	0.599	0.019	0.400	0.730
Women → Green	0.833	−0.001	0.651	0.964

Source: Authors' calculation.

The HTMT correlation ratio is less than 0.90, which implies that the discriminant validity is supported by the HTMT correlation ratio. The bootstrapping technique was used to examined the hypotheses, with 5000 bootstrap subsamples. The results show that women's empowerment outlines 32.1% (0.321) of the variation in financial literacy (See in Figure 2). Women's empowerment and financial literacy, on the other hand, account for 74.9% (0.749) of the variation in green microfinance.
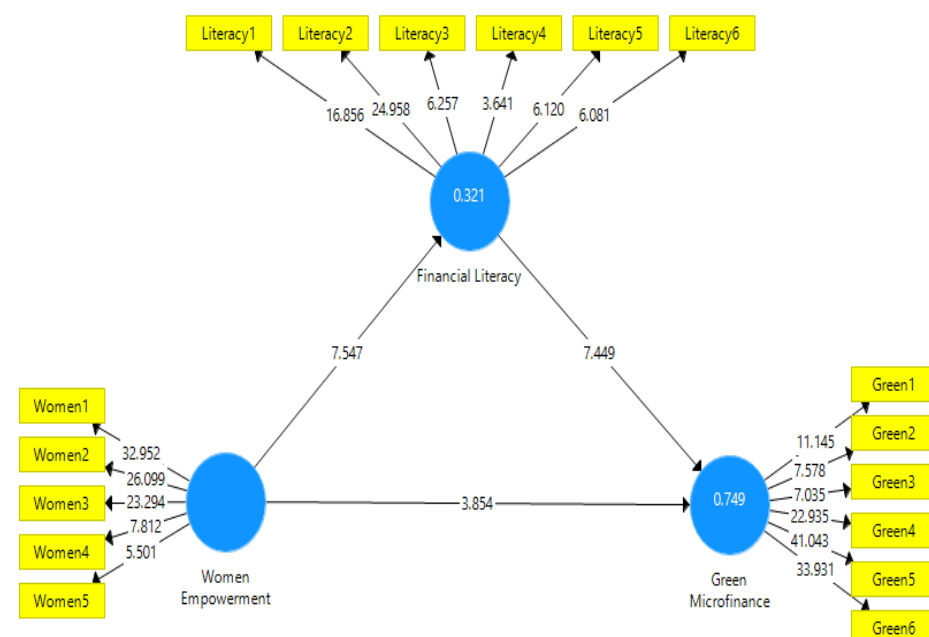
Figure 2. Variance-based SEM results. Note: The values within financial literacy (0.321) and green microfinance (0.749) represent the coefficient of determination (R^2 scores). The values within the arrow, such as 7.547, 7.449, and 3.854, indicate *t*-statistics. The values within the latent (circle) and indicators (rectangle) emphasize the *t*-statistics of outer loadings.

The goodness-of-fit (GoF) index of the structural model was checked in order to compare the effects of structural model relationships [45]. The main method for testing the models' explanatory power is by reference to R^2 score [46]. The GoF index had already been calculated by the square root of average variance extracted times R squared ($\sqrt{\text{AVE} \times R^2}$) [47]. Therefore, GoF $= \sqrt{\text{AVE} \times R^2} = \sqrt{0.587 \times 0.385} = 0.476$. A Goodness-of-fit rating of 0.476 denotes a satisfactory model fit and considerable predictive power. The results of hypothesis testing are displayed in Table 5 below.

$$\text{Green Microfinance} = 0.365 \text{ Women's Empowerment} \qquad (4)$$

$$\text{Financial Literacy} = 0.566 \text{ Women's Empowerment} \qquad (5)$$

$$\text{Green Microfinance} = 0.342 \text{ Women's Empowerment} + 0.604 \text{Financial Literacy} \qquad (6)$$

Table 5. Hypothesis testing.

Hypothesis	Effect	β	*p*-Value	Decision
1	Women → Literacy	0.566	0.000 ***	H1 is supported
2	Literacy → Green	0.604	0.000 ***	H2 is supported
3	Women → Green	0.365	0.000 ***	H3 is supported
4	Women → Literacy → Green	0.342	0.000 ***	H4 is supported
Mediation	Test statistic	Std. Error	*p*-value	Decision
Sobel test	5.304	0.064	0.000 ***	Mediation is supported

Note: *** $p < 0.001$ level. The Sobel test equation is z-value = $ab/\mathrm{SQRT}(b^2 s_a{}^2 + a^2 s_b{}^2)$. For the Sobel test, the reported *p*-values (rounded to eight decimal places) are derived from the unit normal distribution using a two-tailed z-test of the hypothesis that the mediated effect equals zero in the population [48].

All of the direct effects are supported. Women's empowerment positively influences financial literacy ($\beta_1 = 0.566$; $p < 0.001$). Financial literacy positively influences green microfinance ($\beta_2 = 0.604$; $p < 0.001$). Women's empowerment positively influences green microfinance ($\beta_3 = 0.465$; $p < 0.001$). The indirect effect is in line with the expected hypothesis ($\beta_4 = 0.342$; $p < 0.001$). From the proposed model, the latent (component) of financial literacy seems to play a mediating role between women's empowerment and green microfinance. Investigation of this mediating effect of financial literacy might enhance insight within the model, and is worthy of additional investigation. The Sobel test supports the argument that financial literacy has a mediating effect on the women's empowerment–green microfinance relation. In addition, the mediating proportion of financial literacy was computed in our study [39].

$$\frac{ab}{c} = 0.9366 \tag{7}$$

Based on the results of this study, financial literacy mediates the relationship between women's empowerment and green microfinance by as much as 93.661%. Future research is suggested in order to explain the other 6.339% of the components.

5. Discussion

The findings show that women's empowerment positively and significantly affects financial literacy. Our results are in line with the previous findings of [27,28]. Women can improve their financial literacy through both formal education and local knowledge after being empowered [27]. To empower women in rural areas, a bottom-up approach based on local wisdom has been implemented. After implementing their local wisdom in the context of rural microfinance initiatives, women's financial literacy (savings and loans) tended to improve [28]. Women's empowerment provided the access for women to enhance their financial understanding through education [9], whether formal or informal. Educated women were more likely to make appropriate judgments, boosting their financial literacy [12]. Increasing women's educational participation might improve their performance capacity in public places [22]. Promoting women's ability is crucial to achieving the SDGs and women's well-being [49]. As a result, the SDG5 must be considered in order to empower all women [2]. The five members of the microfinance group underlined that local government and social support for their activities might assist them in realizing their visions in a larger way. The women could design their green business ideas by considering their local wisdom (Marapu value), according to the FGD results.

During the prevalence and persistence of COVID-19, women's empowerment in the women's farming groups struggled with the economic recovery. The group members enhanced their financial capability with the tacit knowledge they acquired from their local wisdom. Regular social gatherings (arisan), savings, loans, and profit-sharing were implemented in the administration, relying on equality and sustainability perspectives [28]. Despite their lower socioeconomic standing, the women participated in the decision-making process in their households and in microfinance initiatives. Based on the FGD results, the

five members of the women's microfinance group underlined that they played an important role in being the breadwinner in their families. Most were involved in the activities of the women's farming groups due to the lack of employment available in the formal sector. They implemented Marapu values in their daily activities to increase their financial knowledge. These Marapu values can be defined as Sumbanese local wisdom for managing economic life in harmony with the natural and social environments. For example, Hillu Kandutuku was implemented for savings and loans purposes (the cage should not be empty). Rotu Padang, referring to avoiding the urge to utilize cattle as an object to protect livestock, enriched understanding of pre-financing. The local spokesperson (Wunang) highlighted that these sources of Sumbanese local wisdom in a savings and investment context could help them overcome their lack of access to formal financial institutions. It indicated that the women's farming groups' current SDG performance significantly improved their financial inclusion (SDG 4). In order to access green loans, women must be financially literate [9,11]. The members of women's microfinance groups highlighted that improving the quality of education was just such a challenge for them to improve household welfare. As a result, it was necessary to have a series of gender-targeted financial education programs targeting various local community groups. In the long-term period, green loans by rural MFIs in Mbatakapidu Village might encourage more green behavior.

Furthermore, women's empowerment enhanced the women's control over household spending and their local microfinance's governance. The women participating in the microfinance initiatives were empowered only due to their direct involvement in income-generating activities combined with their local wisdom [11]. The East Sumba government had designed an Integrated Operation Cooperation Economic Development of Villagers policy for community economic empowerment, as stated by a local government officer during the FGD session. While the government of East Sumba had a program related to gender issues, it needed to measure the variation of beneficiaries (men or women) from the gender-targeted programs. The women no longer relied on their spouses, because they participated in the green microfinance schemes. The decision to prepare their child's education was an example of women's empowerment. The product sale of green microfinance efforts could enable regular social gathering activities for children's education, savings, and loans. Green loans were given to female farmers in the form of yarn for weaving, biogas equipment, organic fertilizer, a micro-hydropower plant, a waste bank, and other items. This demonstrates that the green loan requirement encouraged the members to start green enterprises [2]. In this way, MFIs changed their practices to become climate-friendly MFIs (SDG 5) [50]. In line with [3–5], the Grameen bank's success was based on women's empowerment through microfinance banks offering micro-savings and loans.

Furthermore, financial literacy seemed to have a mediating role in the relationship between women's empowerment and green microfinance. According to the experience of women's farming groups, women's empowerment could be a powerful tool supporting green microfinance if combined with financial literacy. This is in line with the findings of [9,11] that the financial literacy had an impact on the women's empowerment and access to microfinance. In Sumba, local knowledge-based financial inclusion (SDG 4) has been acknowledged as a policy option for the local government to support women's empowerment (SDG 5) and climate action (SDG 13). Sumba has an indigenous belief system known as Marapu. These Marapu beliefs heavily influence the Sumbanese people's daily lives. Sumba's traditional dwelling is built upon this belief. Their houses are traditionally divided into three levels: the upper level for Gods and ancestor spirits, the middle level for humans, and the lower level for domestic animals [51,52]. As highlighted by Wunang ('the traditional spokesperson'), this local Sumbanese wisdom has transformed into a source of social capital, influencing the long-term viability of green microfinance activities.

This research offers an important contribution to the related body of knowledge and practice by responding to the previous researches [1,2,9,11]. Nawaz, Lindahl, and Mokvist studied the relationship between women's empowerment, financial literacy, and microfinance [9,11]. Their studies focused on microfinance rather than green microfinance, and

used qualitative approaches; the results of qualitative approaches frequently lack existential verification [53]. Atahau et al. explored green microfinance, women's empowerment, renewable energy, governance, and triple bottom line indicators [1,2]. They emphasized women's financial ability rather than financial literacy. We filled out certain limitations of previous research by employing financial literacy as a mediating variable for a novel approach to the proposed model of women and green microfinance integration. Interestingly, this study offers a unique perspective to examine an initiative to improve women's financial literacy based on local wisdom (Marapu). In this way they were able to contribute as active actors in supporting the SDG targets (SDG 4, 5, and 13). This is consistent with the women's farming groups' vision of overcoming poverty by increasing women's role in green microfinance practices through adequate financial literacy. Lastly, creating a village model to examine women and green microfinance integration through financial literacy was one possible solution to meet the target. The village model's penta-helix stakeholders could be included by combining the government, public, non-government organizations, university social responsibility, and corporate social responsibility. Such collaboration can be expected to accelerate the achievement of the SDG targets.

6. Conclusions

Our findings show that women might improve their financial literacy and empower themselves in green microfinance initiatives through their local wisdom. The local wisdom in this case came from their belief in the ancestors, or Marapu. The local government's pro-women (SDG 5) and pro-climate (SDG 13) policies, as the ultimate goal of the research, were expected to be achieved through strengthening the pro-literacy (SDG 4) policy. To achieve the target, women's financial inclusion community, examining the climate and women's empowerment policies through green microfinance institutions, was a possible solution [2]. Nawaz, Lindahl, and Mokvist emphasized that microfinance could be a powerful tool for women's empowerment when combined with financial literacy [9,11]. Based on previous research, the success of developing green microfinance was possible by improving women's financial inclusion in rural areas [1,2]. Therefore, the women's farming groups needed to collaborate with local higher education institutions, industry, government, and the broader community in order to encourage sustainable green microfinance. The research and development results must provide solutions for women's empowerment to support a sustainable development.

In terms of policy implications, establishing women's role-based local financial literacy is an alternative strategy for sustainable green microfinance. The government must allocate funds for gender-targeted programs to enhance women's financial inclusion. To answer future challenges in the digital era, local government needs to improve financial education for women in green microfinance activities; in this case, this can be accomplished by encouraging women's understanding of products and services in the financial and banking sectors.

For this reason, combining a spiritual quotient (local wisdom), intellectual quotient (financial literacy), and emotional quotient (environmental ethics) is believed to provide a holistic understanding of the sustainability of green microfinance. Further, the methodology of this study implies that in order to deal with tiny sample sizes, the bootstrapping technique is suggested [38]. The bootstrapping technique is a nonparametric method for determining the statistical significance of variance-based SEM outcomes, such as path coefficients, Cronbach's alpha, HTMT, and R^2 values. Our research exposed the mediating impact of financial literacy using the Sobel test to formally validate our findings.

However, along with its strengths, this study has several limitations. First, because we utilized the purposive sampling method, future research is suggested to apply another sampling method, such as the random sampling method, to escalate the study's generalizability. In relation to the location of this study, it is suggested that future research examine a larger research location, including all areas on Sumba Island, or specifically women's farming groups across Indonesia, in order to increase the generalizability level of

the findings. Moreover, the research scope of this study was limited to a cross-section at a specific point in time. To measure actual green MFI sustainability, it might be important to measure the length of time during which the green MFI operates. Hence, a longitudinal study considering the impact of seasonality and with a cross-sectional scope is highly recommended in order to increase the research validity. The current COVID-19 pandemic might have an impact on data collection in the field. Thus, we recommend that future research conduct in-depth interviews to enrich research data collection.

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