



Exploring the Influence of Gender on Cassava (*Manihot esculenta*) Value Chain among Smallholder Farmers: A Case of Central Highlands, Vietnam

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ABSTRACT

In the face of challenges such as nonsufficient rural incomes and gender factors influences, numerous rural women are enhancing their contributions to the farming system by actively participating in the agricultural value chain. This involvement is leading to improvements in agricultural output, the income of household, and sustainable living. In this research, we explore the factors influencing involvement in cassava production in the Central Highlands in the Vietnam and decision-making within the cassava value chain, all from a gender aspect. We collected data by conducting a survey based on questionnaires with 330 smallholder farmers, conducting in-depth interviews with informative experts, and facilitating focus group-discussions. In this regard, the Ordinary least squares regression and Probit models were employed within Heckman model with two-stage to identify the factors influencing women's choices regarding involvement in cultivation of cassava plant, the extent of their participation, and their engagement in other phases of this case. According to the survey findings, men play a dominant role in all aspects of cassava farming. However, there is a more balanced gender representation when it comes to decision-making regarding participation in cassava production and determining the cassava volume to be provided for trade objectives. This article highlights the ongoing challenges faced by female smallholder farmers and underscores that women's empowerment depends on the equitable dynamics within households, as well as social norms within the community.

Keywords: Gender perspective; Decision-making; Household farmers; Gender equality; Cassava value chain

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INTRODUCTION

Agriculture constitutes a vital component of a nation's economy, as emphasized by the research of Salimova et al. (2020), with the Vietnamese economy being no exception. It makes up roughly eighteen percent of the gross domestic product and provides jobs for 47% of the overall workforce, as reported by Ho et al. (2019). In the agricultural sector, women hold an undeniable and crucial role (Anderson et al., 2021), making up 43% of the labor force in developing countries, as noted by Patil et al. (2018). In Vietnam, the primary source of sustainable livelihood for the majority of the population is farming and various agricultural pursuits (Spangenberg, 2019).

Cassava (*Manihot esculenta* Crantz) contents are useful ingredient for taking care of skin, hair and beauty. Cassava is one of these useful substances whose properties and benefits are really amazing. Cassava is a tropical root vegetable that can be used with potatoes, carrots, radishes and other roots like this (Waluchio, 2016; Alamgir, 2017). Flour is also used as a type of starch needed in cooking around the world. Cassava flour is

readily available from grocery stores and perfumeries, but it's a little tricky to make fresh fruit or the same root as kawasa (Vignes, 2002; Kruger, 2014).

Cassava cultivation holds significance in Vietnamese agriculture, contributing significantly to the livelihoods of impoverished individuals (Ho et al., 2019). The entire nation has around 530,300 hectares dedicated to cassava cultivation with a notable increase in cassava production of 10,62 million tonnes (GSO, 2022b). Recent research indicates disparities in the perceptions of men and women on various societal issues worldwide. Men tend to have a prominent role in terms of both basic human rights and the influence they wield within their home and communities (Arts, 2017). Therefore, men have greater access to knowledge and markets, providing them with a favorable position over women who tend to be more weak. Consequently, men are more engaged in cash-crop activities, which leads to them enjoying higher income levels. Nevertheless, research findings indicate that the role of women, particularly those responsible for the welfare of the household, can be enhanced when decisions are made collaboratively by both men and women, rather than solely

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by men (Zunaidi and Maghfiroh, 2021). Hence, employing the value chain approach for agricultural products can help tackle gender inequality within households. Furthermore, numerous studies addressing gender issues have primarily concentrated on contemporary value chains, as they have investigated agricultural value chains related to high-priced cash crops like cashew nuts, avocados and cocoa (Olwande et al., 2013). Hence, there has been limited examination of the impact of traditional gender roles, including the interactions among roles assigned to males and females within the household-level cassava supply chain (Ahmadu and Idisi, 2014). Additionally, farmers within the value chain of cassava experience lower profits compared to other stakeholders (Olukunle, 2013). Furthermore, Dolan (2010) revealed a significant gender-based discrimination against female farmers within the context of contract farming in the Kenyan horticultural export industry. Moreover, Barrientos et al. (2003) documented the exploitation of women agricultural laborers in the African horticulture sector. Nevertheless, alternate scholars have documented that females in Senegal wield significant influence and hold a crucial role within contemporary supply value chains (Maertens and Swinnen, 2006). Gender disparities within the realm of agriculture stem from a multifaceted array of issues, encompassing control over resources, decision-making authority, labor dynamics, and familial support (Kerr, 2005). Hence, the narrowing of the gender gap may be attributed to the increased active participation of women in economic endeavors compared to previous times. Moreover, the decision for women to enter the workforce is a multifaceted matter influenced by factors like societal norms, educational achievements, and caregiving responsibilities, such as those towards children and the elderly reported by (Sarkar et al., 2019). Nonetheless, Garikipati (2009) contended that women tend to engage in agricultural activities whenever the opportunity arises. To date, no empirical research has been conducted to examine the impact of gender within the Vietnamese cassava value chain. Prior research on the cassava value chain has primarily concentrated on evaluating its cost and benefit aspects, as indicated by (Son et al., 2016). Additional research has explored the connections in the transition from cassava cultivation to consumption, in addition to the interrelationships among the participants within the cassava value chain, with a particular emphasis on the crucial role played by middlemen (Adjimoti, 2015). Furthermore, as highlighted by Son et al. (2016), the earnings generated from cassava play a fundamental role in the sustenance of rural households and the well-being of farmers. Nevertheless, the results presented in this current paper deviate significantly from those of prior studies in this domain, as they underscore the pivotal role of rural women in enhancing food security and managing natural resources, even in the face of inequality and discrimination (Doss et al., 2018). This current study enriches the existing literature in several respects, highlighting the multifaceted factors influencing women's engagement in the labor force. The primary objective of this research is to evaluate the determinants influencing women's choices regarding participation in cassava cultivation and the extent of their involvement. Furthermore, this study endeavors to identify the factors affecting farmers' engagement in the market and the degree of their involvement within the cassava value chain. The insights gained from this paper will provide valuable data for crafting informed policies concerning cassava cultivation in the Vietnam's Central Highlands and addressing gender's role in promoting sustainable farming practices in rural regions.

MATERIALS & METHODS

Field and Area of Study

The Central Highlands of Vietnam forms a plateau in the near of southern border of Laos and the northeastern-border of Cambodia. In this location, Kon Tum province shares its boundaries with both Laos and Cambodia, whereas Gia Lai province and Dak Lak province share borders solely with Laos. Lam Dong province, being landlocked, does not share an international border with any other country. The Central Highlands can be categorized into three subregions based on variations in topography and climate. These subregions are as follows: The North Central Highlands, which includes Gia Lai and Kon Tum provinces; the Middle Central Highlands, encompassing Dak Nong and Dak Lak provinces; and the South-Central Highlands, covering Lam Dong province. The Middle Central Highlands have a lower altitude and consequently experience higher temperatures compared to the other two subregions (Dam, 2022). This region spans a total area of 54,548.30 square kilometers, with a population exceeding 6.09 million people and a population density of 112 individuals per square kilometer (GSO, 2022a).

Data Collection

The study adopted a case study methodology, one of the various techniques employed in social science research (Yin et al., 2009). Structured questionnaires were used as the primary tool for data collection (Fonji et al., 2017). A cross-sectional design was employed by the researchers, enabling them to effectively achieve the study objectives while optimizing time efficiency during the data collection process (Kothari, 2004). Household characteristics were gathered from multiple sources, incorporating a household survey, interviews with essential sources of information, and conducting focus-group discussions with household leaders (Mukete et al., 2018). Detailed interviews were carried out with essential informants, such as local officials and extension officers. Additionally, focus group discussions were organized with the heads of households involved in cassava farming in each province. Consequently, three districts were chosen in each province, and data collection involved visiting households to administer structured questionnaires. The complete sample comprised 330 households, each of which was involved in cassava farming.

Study Methodologies

Statistical data underwent analysis through the software package IBM SPSS Statistics 24 utilizing both ordinary least squares and probit regression models, as referenced by (Okoye et al., 2010). We employed a Heckman model with two stages as a suitable framework to examine decision-making processes related to the value chain of cassava. This model was utilized to assess the variables influencing women's choices regarding participation and the extent of their involvement in the cassava cultivation sector and the cassava marketplace (Sebatta et al., 2014). The model followed a two-step procedure, involving the examination of: (1) Women's choices regarding their involvement in cassava farming and the cassava market, and (2) The extent of farmers' engagement in cultivation of cassava and the cassava marketplace (Sebatta et al., 2014). In the model of Heckman, the initial stage model equation employs a probit model to gauge the impact of various factors on the decision of whether to engage in market participation and to what degree (Ahmadu and Idisi, 2014).

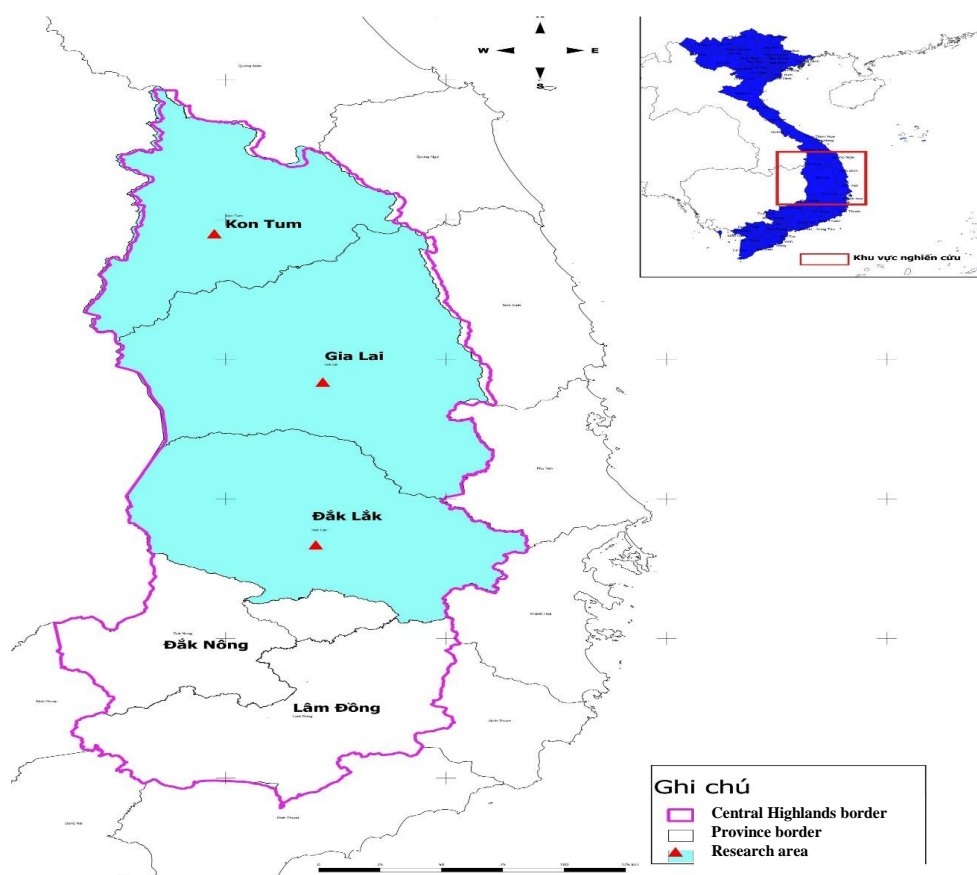


Fig. 1: Map and location of the studied area.

The participation of Women farmers engaged in both production and selling was considered the dependent variable, using a binary measure of 1 to indicate a woman's willingness to be involved in cassava farming and 0 otherwise. The probit model equation employed for this purpose was suggested by (Okoye et al., 2010), as follows:

$$Y^* = \beta_0 + \beta_i X_i + \mu \quad (1)$$

Subsequent to the research by Sebatta et al. (2014), the Heckman model was computed:

$$y_{1i} = 0 \text{ if } Q_i \leq 0 \\ y_{1i} = 1 \text{ if } Q_i \geq 0 \quad (2)$$

Where y_1 represents the binary response, while Q_i denotes the amount of cassava cultivated by a female individual.

The involvement equation was subsequently reformulated as follows:

$$Y_1^* = \beta_{1i} X_{1i} + \varepsilon_{1i} \quad (3)$$

Where Y_1^* stands as a latent variable that signifies the utility a farmer derives from their market participation.

The binary model was expressed as follows:

$$Y = \begin{cases} 1, & \text{if the farmer sells any amount of cassava} \\ 0, & \text{otherwise} \end{cases} \quad (4)$$

Regarding the probit model in the initial step, the estimation was carried out in the subsequent manner:

$$Pr(Y_1) = f(x_1, x_2, \dots, x_n) \quad (5)$$

In this equation, $Pr(Y_1)$ represents the probability of a farmer deciding to sell cassava in the market or not, while x_i , and so on, are the variables and "e" represents the error term following a normal distribution.

In the second phase of the model of Heckman, the degrees of involvement were computed using Ordinary Least Squares and assessed to examine the impact of the proposed variables in relation to the quantity of cassava cultivation or harvesting.

The conceptual model can be depicted as follows:

$$Q_i = f(y_1, y_2, \dots, y_n) \quad (6)$$

Where Q_i represents the cassava production volume, and y_n signifies the independent variables.

RESULTS

The Production Phase of the Cassava Value Chain The Extent of Female and Male Involvement in the Production Phase of the Cassava Value Chain

The amount of cassava produced served as the dependent variable in both the Ordinary Least Squares (OLS) regression models for male and female. It was subjected to a logarithmic transformation, as indicated in Table 1. The variable representing experience in cassava cultivation (ECC) was subject to a square-root transformation.

The independent variables for men, such as the age of the household head (AHH), the count of individuals under 18 (IU18), the total number of males in the household (NMH), the size of residential land (ARL), and the household area (HHA), underwent a logarithmic transformation. The paragraph discusses the use of the backward selection method to refine the Ordinary Least Squares (OLS) model for both men and women. In the case of women, the OLS model had an R^2 value of 0.65, indicating that it explained 65% of the variance in harvested cassava. It was found that the natural logarithmic transformation of the cassava cultivation area (Ln_CCA) was a highly significant positive predictor with a 99% confidence level, strongly influencing the amount of cassava grown by women. This indicates that the size of the cassava cultivation area strongly impacts the extent of women's involvement in the market. This scenario can be clarified by the presence of available arable land, which can be utilized for the cultivation of not only cassava but also a variety of other crops. Furthermore, since cassava is

frequently considered a less prioritized or marginal crop, farmers, especially women, may choose for cassava cultivation if their households possess larger land holdings.

Table 1: The Ordinary least squares (OLS) estimation for the cassava production levels of both women and men in the Central Highlands

Variable	Model 1 (Male); R ² = 0.72		Model 2 (Female); R ² = 0.65	
	Coefficients	Std. Error	Coefficients	Std. Error
(Constant)	1.723***	0.824	2.721***	0.382
OWB	- 0.150	0.101	--	--
OLT	- 0.122	0.090	- 0.069	0.080
Ln_AHH	0.440**	0.171	--	--
Ln_IU18	0.162**	0.070	0.097	0.079
Sqrt_ECC	--	--	0.124***	0.050
Ln_NMH	- 0.281**	0.111	- 0.115	0.151
INTER	--	--	- 0.075	0.112
SPC	- 0.0001	0.000	- 0.0012***	0.000
Ln_CCA	--	--	1.037***	0.065
Ln_ARL	1.183***	0.080	--	--
Ln_TMH	--	--	0.172	0.201
Ln_HHA	- 0.135	0.090	--	--

Significant level: * = 10%; ** = 5%; *** = 1%

Table 2: Probit model estimations for women's participation decisions in the cassava value chain's production phase

Variables	Coefficient	Std. Error
ECC		0.129*
ACA	0.1038*	0.059
SPC	0.0007	0.001
1/FLO_Sqrt	- 29.840**	14.01
AHH	0.023	0.069
OLT	- 0.375	1.291
HHA	0.010	0.009
INTER	0.571	0.783
FLE_Sq	2.286**	1.013
ARL	4.396	4.68
FLO	- 0.008	0.008
IU18_Sq	- 0.371*	0.185
IU18	1.389	1.008
ARL_Sq	- 3.847**	1.057

Significant level: * = 10%; ** = 5%; *** = 1%; McFadden pseudo R² = 0.619.

Table 3: OLS model estimates for the volume of cassava sold by farmers in the Central Highlands, representing farmers' market participation

Variable	Coefficients	Std. Error
(Constant)	1.921***	0.510
Ln_IU18	0.132**	0.048
Ln_AHH_Sq	0.164**	0.071
Ln_NMH_Sq	- 0.094**	0.039
OLT	- 0.092	0.052
Sqrt_ECC	0.057	0.036
Ln_CCA	1.055***	0.052
OWB	- 0.115	0.077
SPC	0.0002	0.00

Significant level: * = 10%; ** = 5%; *** = 1%

Determinants Influencing Women's Choices to Engage in the Production Phase

In Table 2, the results of a probit model analysis are shown, which focuses on factors affecting women's participation in the cassava value chain. The model's goodness of fit, as measured by the McFadden pseudo R², was found to be 0.619. It was observed that the household's head played a crucial role in deciding to cultivate cassava. Additionally, factors like the farmer's education level (FLE) and the square of the education

level (FLE_Sq) were identified as significant determinants in the household head's decisions regarding cassava cultivation.

The factors included the square of housing land area (ARL_Sq) and the inverse of the square root of the loan of farmers (1/FLO_Sqrt), and these exhibited statistical significance at a significance level of $p < 0.05$. The outcomes of the probit model regression displayed in Table 2 deviated from the initial expectations. Surprisingly, the variables related to squared land area (ARL_Sq) and the reciprocal of the square root of loans (1/FLO_Sqrt) showed the most significant adverse effects, as evidenced by their statistically significant coefficients of $p < 0.05$. This contrasted with the initial anticipation that the residential land area (ARL) and the loans obtained by farmers (FLO) would exhibit a positive correlation with cassava cultivation decisions. Hence, it seems that the influence of these variables was, in fact, shaped by women's decisions to engage in the cassava value chain. Additionally, it was observed that both the experience of farmer in cassava farming (ECC) and the amount of cassava (ACA) variables had a positive impact on women's involvement in cassava farming and were statistically significant at the $p < 0.10$ level.

The Primary Determinants Influencing Farmers' Engagement in the Market of Cassava

The data presented in Table 3 reveals the extent of farmers' involvement in the market, defined by the quantity they supply. The results from the OLS regression model suggest that the natural logarithm transformation of the cassava cultivation area (Ln_CCA) has a notably positive and statistically significant impact on farmers' engagement in the market ($p < 0.01$). The reason for this is that farmers who possess larger plots of land will have more flexibility to cultivate not only cassava but also other crops. Consequently, they are likely to allocate a greater portion of their arable land to cassava cultivation. The outcomes of the OLS regression model reveal that the natural logarithm transformation of individuals younger than 18 years of age. (Ln_IU18) and the squared variable (Ln_AHH_Sq) both displayed a positive and statistically significant influence ($p < 0.05$) on the quantity of cassava that the farmers sell. A farmer's level of involvement in the market is influenced not only by their age but also by their proficiency in cassava farming. Experience can provide farmers with an advantage in terms of obtaining and comprehending market data, as well as promoting the exchange of knowledge.

On the other hand, the natural logarithm transformation of the squared NMH (total number of males in the household) variable (Ln_NMH_Sq) exhibited a statistically significant and negative impact on market participation ($p < 0.05$). This suggests that as the number of males in a household increases, there is a diminishing marginal effect on participation in the cassava market as a supplier.

DISCUSSION

The results presented in this study are consistent with the findings reported by Masamha et al. (2018b) in their research on gender analysis of smallholder farmer's participation in the cassava value chain in Tanzania the cassava food value chain. Their study revealed that women had a significant role in the processing stage of the value chain of cassava within households. The study's findings echo Coles and Mitchell, (2010) assertion that gender inequality serves as a significant difficulty to women's participation in the physical-demanding

Table 4: Estimated significant variables from the Probit model for females' decisions regarding participation in production

Variables	Coefficient	Std. Error
ACA	0.102*	0.061
ECC	0.145*	0.083
IU18_Sq	- 0.482*	0.251
1/FLO_Sqrt	- 28.94**	12.07
FLE_Sq	1.29**	1.080
ARL_Sq	- 2.94**	1.582

Significant level: * = 10%; ** = 5%; *** = 1%

Table 5: Estimated significant variables for women's participation in the cultivation stage

Model	Variables	Coefficients	Std. Error
Male R ² = 0.72	(Constant)	1.691**	0.82
	Ln_ARL	1.160***	0.080
	Ln_NMH	- 0.283**	0.110
	Ln_AHH	0.433**	0.170
	Ln_IU18	0.161**	0.072
Female R ² = 0.65	(Constant)	2.670***	0.382
	Sqrt_ECC	0.125***	0.050
	Ln_CCA	1.023***	0.081
	SPC	- 0.001**	0.00

Significant level: * = 10%; ** = 5%; *** = 1%

Table 6: Significant variables provide estimates of the factors influencing farmers' decisions to participate in the cassava value chain's market

Variables	Coefficient	Std. Error
ARL	3.227*** (10.86)	0.63
ECC	0.064** (0.47)	0.03
INTER	- 0.689* (6.39)	0.37
OLT	- 0.09 (1.04)	0.06
Sqrt_ECC	0.05 (0.59)	0.03

Significant level: * = 10%; ** = 5%; *** = 1%

Table 7: Key variables gauge farmers' involvement in the market activities of cassava value chain

Variables	Coefficients	Std. Error
(Constant)	1.815***	0.435
FLE	0.035*	0.002
Ln_AHH_Sq	0.147**	0.105
OLT	2.057	1.235
Ln_CCA	1.040***	0.102
AHH	1.005	0.250
Ln_NMH_Sq	- 0.092**	0.00
Ln_IU18	0.125**	0.105

Significant level: * = 10%; ** = 5%; *** = 1%

production phases of the cassava value chain, where men tend to dominate while women contribute to a limited extent.

The Determinants Affecting Women's Choice to Engage in Cassava Farming

Our research reveals that access to credit supports female leadership in households, in line with the findings of Saenz and Thompson, (2017), while the ownership of local transport has a minimal and negative effect on women's participation, which was unexpected, likely due to the common practice of middlemen buying fresh cassava at the farm. As a result, farmers may not feel the need to transport their produce to the market, and while this variable had a negative impact, it did not reach statistical significance, aligning with the results of Masamha et al. (2018b) where the ARL_Sq variable showed a significant and negative correlation with women's involvement in cassava farming ($p < 0.05$). The negative effect of the squared land area aligns

with Saenz and Thompson's, (2017) findings on the gender-policy dynamics in farm households, while the squared variable related to the number of individuals under 18 years old had a significant negative impact on women's participation in cassava cultivation, in contrast to our current study where it showed noteworthy positive effects ($p < 0.05$). The variable 1/FLO_Sqrt had a significant negative effect ($p < 0.05$) on women's participation in cassava cultivation, suggesting that improved access to formal credit could lead farmers to choose higher-value crops over cassava as indicated in (Table 4).

Previous researchers have primarily explored factors like employment, working conditions, income, age, and marital status in the examination of gender dynamics within the value chain, and although the favorable impact of cassava selling prices on women's engagement in cassava cultivation was observed, it did not achieve statistical significance; this finding aligns with the outcomes of Van et al. (2018), which identified that women's participation in value chain was influenced by educational attainment, the count of dependents and credit accessibility.

The Extent of Women's Involvement in the Production Phase

Our study's findings regarding the extent of involvement in the production phase of the cassava value chain by both women and men sharply differ from those of Masamha et al. (2018b), as our study showed similar R² coefficients for women and men (0.65 and 0.72) in contrast to Masamha et al.'s results, where the R² for females was about twice that of males (0.45 and 0.26). The model's explanation of the overall variation is smaller for men than for women, and the omission of variables like marital status, region, and age, as seen in previous research, may have affected the significance of the outcomes in the OLS model; furthermore, in the male model, the observation regarding the household head's age aligns with the findings of Ayamga et al. (2006), and is statistically significant.

However, the variables introduced in the regression model for females as shown in (Table 5), such as the selling price of cassava (SPC), The logarithmic conversion of the cassava cultivation area (Ln_CCA) and the square root of farmer's cassava cultivation experience (Sqrt_ECC), showed statistically significant effects, including both negative and positive, which contrasts with the findings related to the market of cereal reported by Siziba and Bulte, (2012).

Determinants impacting the Farmer's Choice to Engage in the Market

The research shows that women have a significant influence on decision-making processes related to their participation in the cassava value chain, differing from and also paralleling previous research findings, as it contradicts Hill and Vigneri's (2011) study on female coffee farmers in Uganda, aligns with Doss's (2001) observation that female farmers primarily engage in subsistence crop cultivation, and shares similarities with Siziba and Bulte's (2012) suggestion that the area of residential land (ARL) can affect farmers' decisions regarding market participation. Nevertheless, the result in this study is notably positive and statistically significant ($p < 0.01$), as shown in (Table 6), in contrast to the earlier study where the effect was found to be non-significant. Furthermore, the results of this research align with the findings of Jagwe et al., (2010), in terms of the influence of selling price and the gender of the household head on decision-making, even though the statistical significance was not established. Furthermore, this study contradicts the findings regarding the farmer's experience (ECC) compared to the results of Jagwe et al. (2010). The

present study found that experience had a positive and significant effect, which contrasts with Jagwe et al.'s research, while it also revealed a negative and significant impact of the farmer's internet access (INTER), consistent with findings by (Njukwe et al., 2014) regarding development cassava value chain in Cameroon.

Gender Roles and Farmers' Market Participation in the Cassava Value Chain

In the context of gender roles within the cassava value chain during the cultivation phase, this study's findings align with Onya et al.'s (2016) research on market participation and value chain of cassava farmers in Abia State, where female household heads played a supporting role in cassava production. The findings of this study also corroborated Radel's (2011) research, indicating limited female involvement in activities such as pesticide spraying and tractor-based land preparation. This can be attributed to women's physical attributes, their comparatively lower educational attainment, and their limited technical skills, all of which could lead to reduced utilization of agricultural machinery compared to men (Andersson et al., 2016). In this case, male household heads were responsible for all agricultural activities, including weeding, harvesting, and production decisions, while the study's results highlighted variations in women's roles compared to African countries, where they were involved not only in planting and weeding, but also in fertilizing, pesticide spraying, and harvesting (Naziri et al., 2014). Regarding the extent of market participation, being a male farmer had a notable negative effect on the amount of cassava sold at the market, which was statistically significant ($p < 0.05$). This discovery contrasts with the results presented by Sebatta et al., (2014). Additionally, as per discussions with the farmers' groups, there is a prevalent perception that cassava is primarily considered a crop associated with women. In this study, women took on roles equal to men, often handling interactions with middlemen during produce sales, a responsibility that varied among households, consistent with findings in Jagwe et al.'s (2010) study on banana market involvement. Our studies concluded that a farmer's experience had significantly affect market participation. Furthermore, the men had more opportunities than women for non-farm income generation through casual labor or private company employment. The observation is consistent with Barrett, (2008), although Jagwe et al. (2010) found a positive and significant impact of the transportation variable, which differs from our study's results, while our findings align with Ahmadu and Idisi, (2014), showing that the Ln_AHH_Sq variable has a positive and statistically significant influence on farmers' market participation decisions with $p < 0.05$ (Table 7).

Conclusion

This study's results, in line with prior research, highlight the limited involvement of women in the cassava value chain compared to men, emphasizing the need for addressing gender equality among smallholder farmers in this context. The study recommends further research to improve the value chain of cassava for the benefit of farmers and stakeholders and to inform local policy development, while acknowledging that these findings pertain to rural women in remote areas and may not represent evolving gender roles in other commercial activities. This study explores the influence of socio-economic and household factors on smallholder farmers' participation in the cassava value chain, emphasizing women's roles, and recommends policy changes to decrease the gender gap and empower women in cassava cultivation and agriculture, especially in Vietnam's Central

Highlands. The government should actively promote awareness of gender considerations among farmers, with a particular emphasis on projects for rural women, as this is an effective strategy to reduce the gender gap, elevate the importance of agriculture, and foster sustainable rural development.

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