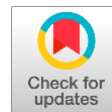


Impact of gender equality on implementation of land use rights through land access of ethnic minorities in central Vietnam



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Abstract The study was conducted to test the impact of gender equality on implementing land use rights through land access of ethnic minorities. Preliminary scale evaluation using Cronbach's Alpha coefficient and EFA exploratory factor analysis with 100 survey samples was performed using SPSS 26.0 software. The official quantitative research model was tested by the partial minimum average method (PLS) in SmartPLS3 software with 349 survey samples from 3 ethnic minority groups, including Cham, Bana, and Hre, in Binh Dinh province, a province in the center of Vietnam. Research results show that all three ethnic groups, Cham, Bana, and Hre, who participated in the survey, said that women currently face many disadvantages in accessing land and exercising land use rights compared to men. The research results confirm a solid positive indirect and positive relationship between gender equality and the exercise of land use rights through the intermediate variable of land access. The research results contribute some theoretical implications in developing land policies to achieve equality in land access, improve land access and realize land use rights for ethnic minorities women.

Keywords: gender equality, ethnic minorities, central region, access to land, land use rights, Vietnam

1. Introduction

As the place connecting the North and South of Vietnam's territory, Central Vietnam has many socioeconomic development opportunities. However, this place also encounters many difficulties due to relatively harsh natural conditions, such as mountainous terrain occupying most of the area, narrow plains, climate with distinct seasonal variation, and soil nutritional poverty. At the same time, the Central region is home to many ethnic minorities, such as the Cham (113438 people), distributed in Ninh Thuan Province (67517), Binh Thuan Province (39557), and Binh Dinh Province with 6364; the Bana ethnic group (215697 people), distributed in Binh Dinh (21650), Phu Yen (4,680), and Gia Lai (189367); and the H're ethnic group (127927 people), distributed in Binh Dinh (11112), Quang Ngai (115268), and Kon Tum (1547) (Committee for Ethnic Minority 2019). Due to harsh natural conditions, combined with outdated production methods, the poverty rate of ethnic minority households in the central region accounts for 55% of the poverty rate, much higher than that of the whole country (52.66%), in which the Cham, Bana, and Hre ethnic groups have a large proportion of poor and near-poor households, with percentages of 27%, 49.4%, and 43%, respectively (Committee for Ethnic Minority 2019). Because the main livelihoods of the Cham, Bana, and Hre ethnic minorities are associated with agricultural and forestry production activities, the land is considered an essential means of production for their lives. The lack of land for production, inefficient production methods, or difficult access to land, especially fertile land, leads to persistent poverty among ethnic minorities (World Bank 2012) due to a lack of food. In fact, on average, an ethnic household has only approximately 0.72 ha of cultivation, so there is not enough land to maintain sustainable livelihoods (Tuan et al 2022).

In Vietnam, 24 532 ethnic minority households lack residential land, and 210 400 ethnic minority households need to support production land. Particularly in Binh Dinh Province (a province in the central coastal region of Vietnam), 1594 ethnic minority households lack residential land and production land, accounting for 17.14% of the total ethnic minority households (Vietnam Fatherland Front Committee of Binh Dinh province 2021). Southern Binh Dinh Province 2021). Meanwhile, "access to land and securing property rights are necessary for people to raise and stabilize their incomes and contribute to economic growth" (Oxfam 2007). They are also necessary for land-based livelihood diversity, sustainable agriculture, economic growth, and poverty alleviation. At the same time, land use rights are considered a prerequisite for maintaining land resource management (Deininger et al 2011). The reality in Vietnam shows that ethnic minorities have a livelihood dependent entirely on agricultural land. However, their ability to access land and exercise their land use rights still faces many inequality-related difficulties regarding gender equality in land access and the implementation of land use rights. Women rarely own property,



not having full access, and are even less able to make crucial decisions regarding the allocation and use of such assets; inequalities often exist in society regarding the distribution of resources, including land, although they make up more than half of the world's population (Nara et al. 2021).

Women's participation in agricultural labor management is high, but direct access to credit and participation in agricultural input markets is limited (Dagdeviren and Oosterbaan 2022). Women cannot even access legal provisions on land use rights even when these benefit them (Ik Dahl et al. 2005). Land use rights are emphasized as an economic asset (Salcedo-La Viña 2020) and are especially important for women (Ayala-Cantu and Morando 2020). Weak land rights can undermine livelihoods, especially in agriculture and food security (Anafo 2015). Although the legal framework facilitates women's access to land, enforcement institutions must improve sensitivities in formalizing property rights (Unger et al. 2023b). Land ownership and use by women and gender equality are considered sustainable development goals (SDGs). The UN-GGIM Expert Group on Land Management and Management has developed an Effective Land Management Framework that emphasizes the urgency of supporting gender equality in land access (UN-GGIM 2019). Therefore, studying the impact of gender equality on the implementation of land use rights through the land access of ethnic minorities in central Vietnam is necessary as a basis for local authorities to propose policy solutions, contributing to achieving gender equality in land access and the implementation of land use rights and improving the efficiency of ethnic minority women's access to and implementation of land use rights.

2. Materials and Methods

2.1. Materials

The research projects are built based on the cooperation of relevant research papers and the authors' recommendations from the research area practice. The proposed research model includes three research concepts with a total observed variable of 17 (Figure 1, Table 1).

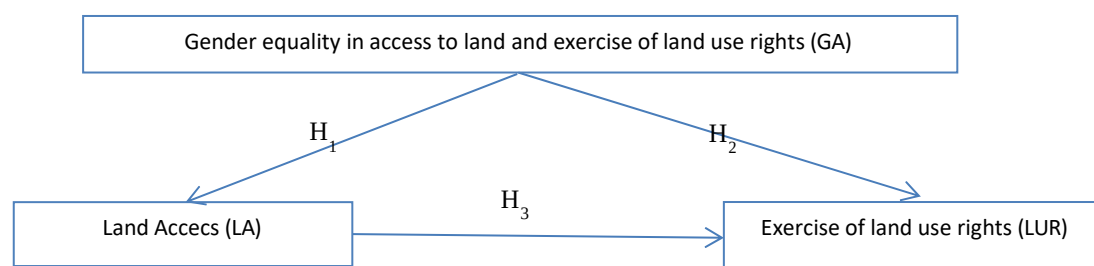


Figure 1 Proposed model.

Collect preliminary quantitative survey data: Collect preliminary quantitative research data by distributing a survey (100 samples). Regarding the preliminary quantitative sample size, according to (Bolton 1993), primary research can be carried out on a manageable sample range; a sample size of 100 is the appropriate level for the researcher to carry out his tests. The preliminary quantitative research step was carried out to solve the objective of testing and measuring the relevance of the impact of gender equality on land access and the implementation of land use rights of the local people Minorities.

Collecting official quantitative survey data: According to (Hair Jr et al. 2017), the smallest sample size to analyze the PLS-SEM is ten times the number of the most significant observed causal variables measured for a concept. With six observed causal variables of gender equality, the minimum sample size of the research model is 60 samples. However, according to (Cohen 1992), if the sample size of the official survey is larger than the minimum sample size requirement, it will help to increase the reliability of the research results. Therefore, in the formal quantitative study, 349 samples were used, which was guaranteed to be larger than the minimum sample size of 60 samples. The formal quantitative survey of 349 samples was carried out after the preliminary quantitative assessment of the scale from the preliminary quantitative survey results.

2.2. Methods

2.2.1. Methods of selecting research sites

The whole province of Binh Dinh currently has 33 communes and townships with ethnic minorities living in groups in 119 villages and hamlets; 39 ethnic minorities with approximately 41768 people, of which three ethnic groups are long-lived, and the majority are the Bana people with 21,650 people (accounting for 51.86%). The H're ethnic group has 11112 people (accounting for 26.6%). The Cham ethnic group has 6,364 people (accounting for 15.2%) (Binh Dinh Provincial Party Committee 2022). The Bana ethnic group in Vinh Thanh district still preserves many unique ethnic cultures among the Bana people in Binh Dinh. The H're ethnic group resides in the An Lao district and considers this the original land of the nation. The Cham ethnic group in Van Canh district retains many of its characteristics (Binh Dinh Province People's Committee 2023).

Therefore, the study surveyed Van Canh, An Lao, and Vinh Thanh districts with three ethnic groups: Cham, Bana, and Hre. In An Lao District, Vinh Thanh, each district surveyed 116 samples. Van Canh district surveyed 117 samples. The survey sample was selected by a random sampling method for households and individuals who are ethnic minorities with at least one transaction related to land access and exercise of the right to land use.

Table 1 Scale of research concepts.

Encode	Scale content	Related research
The scale of Gender Equality in Access to Land and Implementation of Land Use Rights (Gender Equality - GA)		
GA1	Women tend to have less access to land and exercise land use rights than men.	(Sewornu 2010), (Doss, Kovarik et al 2015), (Nara et al 2021), (Dagdeviren and Oosterbaan 2022)
GA2	Women are less likely to have access to legal provisions on land access and exercise of land use rights even when favorable to them.	(Ikdahl et al 2005)
GA3	Women have limited access to land through donation rights (Divorced women must return to their families, unmarried women are not married, and unmarried women are often prevented from receiving their fathers. mother donated land).	(De Janvry et al 2001)
GA4	Women are expected to access land through their husbands rather than directly through their families or land market transactions.	(Kevane and Gray 1999)
GA5	Women may have restricted rights to a land parcel even if it had been certified for land use rights.	(Mearns 1999), (Lambrecht 2016), (Meinzen-Dick et al 2019)
GA6	Women feel more worried about land assets when there are disagreements in the family, especially in the case of divorce.	(Feyertag et al 2021)
The scale of Land Access (LA)		
LA1	Television and newspapers help ethnic minorities to access land information effectively.	(Missingham 2009), (Rensel et al 2006)
LA2	The level of inspection and examination by competent authorities in the field of land creates better conditions for ethnic minorities to access land.	(Martin 2004)
LA3	Social relationships, friends, and relatives help ethnic minorities to access land more effectively.	(De Janvry et al 2001), (Benjaminsen and Lund Christian 2012)
LA4	High land prices limit the ability of ethnic minorities to access land.	(Binswanger and Deininger 1997), (De Janvry et al 2001)
LA5	Your social position helps to improve the accessibility of land information for ethnic minorities.	Recommended by the author
The scale of Exercise of Land Use Rights (LUR)		
LUR1	Exercising the right to lease land helps to expand the production scale of ethnic minorities.	(Mearns 1999), (Lambrecht and Asare 2016; Muraoka et al 2018)
LUR2	Realizing the transfer of land use rights is an important method to expand the arable land fund of ethnic minorities.	(Lambrecht and Asare 2016)
LUR3	The right to inherit the land of ethnic minorities is affected by matriarchy and patriarchy.	Recommended by the author
LUR4	The right to donate land to ethnic minorities is affected by matriarchy and patriarchy.	Recommended by the author
LUR5	Community culture affects the implementation of land use rights of ethnic minorities.	(Agarwal 1997), (De Janvry et al 2001)
LUR6	Weak implementation of land rights can reduce the livelihoods of ethnic minorities.	(Anafo 2015)

2.2.2. Data processing methods

For data obtained from the preliminary quantitative survey, Cronbach's alpha analysis and exploratory factor analysis (EFA) were carried out using SPSS 26.0 software to evaluate the reliability and value of the scales. The results obtained from this step help to complete the survey form, preparing for the official data collection step. The official quantitative test was performed using Smart PLS 3 software for the data obtained from the official quantitative survey. in which

Evaluation of scale reliability: Internal consistency was checked by three criteria: Cronbach's alpha, composite reliability CR, and RhoA coefficient. The values of Cronbach's alpha, composite reliability CR, and RhoA coefficients, if they are within the range of 0.7 to 0.95, show the appropriateness of the reliability of the scales used (Dijkstra and Henseler 2015; Hair Jr et al 2017).

Evaluation of scale convergent validity: Outer loadings coefficients and the average variance extracted (AVE) check the scale's convergent validity. The minimum for the outer loading coefficients of the observed variable is 0.50 (Hulland 1999). An AVE value greater than 0.5 is good for accepting a scale with convergent validity (Hair Jr et al 2017).

Evaluation of the discriminant validity of the scale: When testing the discriminant validity of the scale, the study applies the PLS-SEM technique to consider the HTMT coefficient (Henseler et al 2015).

2.2.3. Rating method using the Likert scale

To know the level of assessment of ethnic minorities toward gender equality, access to land, and exercise of land use rights, the authors use a 5-point Likert scale (Likert 1932) with a scale of points identified as follows: 1. Totally disagree; 2. Disagree; 3. Normal; 4. Agree; 5. Totally agree. The value of the people's evaluation score (m) is determined by the formula: $m = \text{Total score of each criterion} / \text{total number of questionnaires}$.

The scale distance (a) is defined as $a = \frac{Max - Min}{n}$ (1). where n is the number of steps of the scale, min is the minimum value of the scale, and max is the maximum value of the scale. With min = 1, max = 5 and n = 5, a = 0.8 (Huong 2017). Accordingly, the level of agreement is divided into 5 levels as follows: Totally agree: $4.20 < m \leq 5.00$; Agree: $3.40 < m \leq 4.20$; Normal: $2.60 < m \leq 3.40$; Disagree: $1.80 < m \leq 2.60$; Totally disagree: $m \leq 1.80$.

2.2.4. One-way Mean Difference Analysis ANOVA

One-way ANOVA was used in the study to compare the views of three ethnic groups, Cham, Bana, and Hre, representing the matriarchal and patriarchal regimes on the issue of equality in access to land and the exercise of land use rights of ethnic minorities.

3. Results

3.1. Check the reliability of the scale from the preliminary quantitative survey

Cronbach's alpha analysis and exploratory factor analysis (EFA) were conducted using SPSS 26.0 software to evaluate the reliability and validity of the scales. The results obtained from this step help to complete the survey form to prepare for the data collection step for the official quantitative survey.

Preliminary assessment of the scale through Cronbach's alpha coefficient: The results of preliminary testing of the scale through Cronbach's alpha coefficient and EFA test using SpSS 26.0 software show that the value of Cronbach's alpha coefficient of the gender equality scale in access to land and exercise of land use rights (GA), the scale of land access (LA), and the scale of exercise of land use rights (LUR) are 0.800, 0.856, and 0.690, respectively. Thus, Cronbach's alpha value of all three scales ensures reliability (> 0.6) (Tho 2013).

Exploratory factor analysis EFA: While using perpendicular rotation, it is not allowed to simultaneously include the dependent and independent variables to perform EFA (Tho 2013). At the same time, pooling the independent and dependent variables together in an exploratory factor analysis and re-examining the dependent relationships is inappropriate (F. Hair Jr, Sarstedt et al. 2014). Therefore, for the research model, EFA was performed three times. The first time, EFA was run for the independent variable Gender Equality in Access to Land and Exercise of land use rights (GA), and the second and third times were run for two dependent variables. Land Access (LA) and Land Use Rights Execution (LUR).

The results of factor analysis to explore the Gender Equality scale (GA) showed that the coefficient KMO = 0.693 (> 0.5), with the value Sig. = 0.000 (< 0.05). By extracting principal components and Varimax rotation, 1 factor is extracted from 6 observed variables at the stop point Eigenvalues of 3.685 > 1 with a total variance of 61.412% $> 50\%$. In addition, the load coefficient of the observed variables of the Gender Equality scale (GA) ranges from 0.671 to 0.854. Thus, all load factors satisfy the condition greater than 0.5 (Hulland 1999). Therefore, it can be concluded that the scale of Gender Equality in Access to Land and Exercise of land use rights (GA) ensures convergent and discriminant values (Tho 2013).

The results of factor analysis to explore the scale of land access (LA) and the scale of realization of land use rights (LUR) show that the KMO coefficients of LA and LUR are 0.795 and 0.808 (> 0.5), respectively, with Sig values. = 0.000 (< 0.05). The method of extracting principal components and varimax rotation shows that, for the land access (LA) scale, there is a factor drawn from 5 observed variables at the stop point. Eigenvalues of 3.583 > 1 with the total variance extracted are 71.669% $> 50\%$. For the scale of realization of land use rights (LUR), there is 1 factor extracted at an eigenvalue equal to 3.533 > 1 . This factor explains 58.889% of the data variation of 6 observed variables participating in EFA. In addition, the load coefficient of the observed variables of the scale of land access (LA) and the scale of realization of land use rights (LUR) both satisfy the condition greater than 0.5 (Hulland 1999). Therefore, it can be concluded that the land access scales and the land use rights exercise scales ensure convergent and discriminant validity (Tho 2013).

Thus, the results of testing the scale at the preliminary quantitative research stage show that all three scales of land access (LA), the exercise of land use rights (LUR), and gender equality in land access and implementation of land use rights (LUR) ensure reliability, convergent value, and discriminant value. The results of the official quantitative research model include three first-order scales with a total of 17 observed variables.

3.2. Testing the measurement model from the official quantitative survey results

The evaluation of the measurement model ensures that the scale used in the formal quantitative research satisfies the criteria of a good scale and is suitable for testing research hypotheses about the impact of gender equality in accessing land and exercising the land use rights of ethnic minorities.

The results of the evaluation of the scale are shown in Table 2, which shows that the outer loading coefficients of most of the observed variables are in the range of 0.584 to 0.942, which is higher than the proposed minimum threshold of 0.50 (Hulland 1999). At the same time, all the corresponding values for two-tailed tests ("t") of the observed variables (ranging from 13.146 to 123.517) are also satisfactory because they are all greater than 2.54 for significance level = 1%. The average variance extracted (AVE) of all latent variables in the model is acceptable because they are all higher than 0.50 (ranging from 0.525 to 0.730) (Hair Jr, Sarstedt et al. 2017). The composite reliability of the latent variables in the research model ranges from 0.868 to 0.942. This result shows that the scales used in the model have very high reliability. The reason is that for exploratory studies, composite reliability (CR) values of only 0.6 to 0.7 have been accepted (Nunnally and Bernstein 1994).

Table 2 Evaluation of the official quantitative scale.

Scale	Outer loadings	Two tailed tests (t)	Scale	Outer loadings	Two tailed tests (t)
The scale of gender equality in access to land and exercise of land use rights (GA) (CR=0.868; AVE=0.525)			The scale of exercise of land use rights (LUR) (CR=0.942; AVE=0.731)		
GA1	0.781	22.279	LA3	0.674	18.190
GA2	0.724	18.166	LA4	0.942	63.689
GA3	0.834	28.525	LUR1	0.877	36.335
GA4	0.732	16.020	LUR2	0.844	55.329
GA5	0.672	17.911	LUR3	0.860	60.721
GA6	0.584	13.146	LUR4	0.936	123.517
The scale of land access (LA) (CR=0.914; AVE=0.684)			LUR5	0.749	21.025
LA1	0.917	36.820	LUR6	0.853	28.742
LA2	0.871	22.232			

Table 3 Heterotrait-Monotrait Ratio (HTMT).

	GA	LA	LUR
GA			
LA	0.915		
LUR	0.516	0.688	

From the measurement model test results, it can be confirmed that the scale used in the research is suitable for testing the research hypotheses in the model.

3.3. Analysis of the practice of accessing land and exercising land use rights of ethnic minority women in Binh Dinh province

Under current Vietnamese law, women have equal access to land. Gender equality in general and gender equality in land access, in particular, have been institutionalized in the Constitution and laws of Vietnam since 1946. However, gender attitudes that often prioritize men and the impact of family traditions, practices, and practices on community codes of conduct are currently significant barriers to women's access to land, predominantly by ethnic minority women (Cam et al 2013). The results of data analysis on women and men of ethnic groups in Vietnam by the Committee for Ethnic Minority Affairs and the United Nations Agency for Gender Equality and Women's Empowerment also confirmed that gender inequality is one of the issues that need attention in ethnic minority areas because ethnic minority women are suffering from inequality in many fields (UN-GGIM 2019). Based on reference to ethnographic studies conducted in Binh Dinh and the opinions of ethnographic experts, especially on land use and management practices, gender inequality in Near Land still exists in community life.

Survey results from 349 subjects who are members of the Cham, Bana, and Hre ethnic minorities have confirmed that there are still inequalities in access to land by ethnic minority women and, therefore, in the exercise of land use rights. Their land use becomes very limited. Specifically, the results from Table 4 show that 349 ethnic minority households and individuals participating in the survey agree that ethnic minority women are the subjects who have been and are being significantly disadvantaged in access to land and exercise of land use rights (mean value ranges from 4.76 to 4.93).

Table 4 shows that all survey respondents agree that women tend to have less access to land and exercise land use rights than men (Mean_{GA1} = 4.87). Women are less likely to have access to legal provisions on land access and the exercise of land use rights even when these benefit them (Mean_{GA2} = 4.81). All survey respondents also confirmed that ethnic minority women currently had limited access to land through donation rights. Specifically, divorced women have to return to their families, and unmarried women and unmarried women are often prevented from receiving land from their parents (Mean_{GA3} = 4.93). When there is no land donation from their parents, women often expect to access land through their husbands rather than directly through the family or land market transactions (Mean_{GA4} = 4.89). However, expectations are often

associated with much anxiety among women when there are disagreements or divorces in the family. Ethnic minority women also have limited rights to land plots, even if the land plot has been certified for use rights. This is reflected in the fact that they cannot decide whether to donate or transfer land, even though it is their property (property formed before marriage) (Mean $GA_5=4.76$, which means 349 survey respondents agree with this view).

According to the research results, ethnic minority women have full access to land use rights, such as the right to convert, transfer, donate, and inherit. However, the exercise of land use rights by ethnic minority women is limited compared to that of men. The statistical results of land use rights that ethnic minority women have limited access to and exercise in are shown in Table 5.

Table 4 Descriptive Statistics.

	N	Minimum	Maximum	Mean	Std. Deviation
GA1	349	4	5	4.87	0.339
GA2	349	4	5	4.81	0.390
GA3	349	4	5	4.93	0.253
GA4	349	4	5	4.89	0.316
GA5	349	4	5	4.76	0.430
GA6	349	4	5	4.78	0.417
Valid N (listwise)	349				

Table 5 Statistical results on land use rights that ethnic minority women have limited access to and exercise of their rights.

Land use rights to which ethnic minority women are restricted from accessing and exercising their rights.	Statistical and survey results in the study area.
Ethnic minority women have limited access to land through inheritance and donation from others.	100% of surveyed households agree with this view.
Ethnic minority women could not decide to donate or transfer land by themselves.	100% of surveyed households said that women could not decide to donate or transfer land themselves. The decision to transfer or donate land is subject to the husband's consent, even though this is a woman's private property.
The division of land from inheritance and donation has a disparity between sons and daughters.	100% of surveyed households believe that the division of land in the case of inheritance and donation of land use rights is not equal between sons and daughters in the family due to the regime's influence of matriarchy and patriarchy and influenced by the community culture.
The right to have names registered on land use proper certificates is still limited for ethnic minority women.	100% of surveyed households agree that the Vietnamese government has regulations on naming husband and wife on land use proper certificates. However, due to the influence of community culture, ethnic minority women are rarely supported to register with their husbands' names on the land use proper certificate when the land use right is recognized.

The author performed a one-way analysis of variance (one-way ANOVA) to assess gender equality in land access from the point of view of ethnic minorities according to matrilineal regimes and descendants. The H're represents the patriarchy, and the Cham, the Bana, represents the matriarchy. The results in Table 6 show that the Levene test's Sig value equals $0.463 > 0.05$. This result proves that there is no variance difference between ethnic minority groups according to matriarchy and patriarchy.

Table 6 Test of Homogeneity of Variances.

		Levene Statistic	df1	df2	Sig.
Gender Equality in Access to Land and Exercise of Land Use Rights (GA)	Based on Mean	0.772	2	346	0.463
	Based on Median	0.641	2	346	0.527
	Based on Median and with adjusted df	0.641	2	343.359	0.527
	Based on trimmed mean	0.709	2	346	0.493

The F test results (Table 7) show that Sig F Test = $0.527 > 0.05$. That is, there is no meaningful difference between different ethnic groups. Thus, there is no difference in the level of assessment related to gender equality in land access of ethnic minorities from 3 ethnic groups, Cham, Bana, and H're; there was no difference in the assessment of gender equality in land access in the matrilineal and patriarchal regimes.

The descriptive statistics (Table 8) show that the mean value of ethnic groups is in the range of 4.8291 to 4.8547 (strongly agree). This result means that even though there are differences in ethnic groups and differences in matriarchal and patriarchal systems, all households and individuals of ethnic minorities participating in the survey agree that ethnic minority

women are currently disadvantaged in accessing land and exercising land use rights. They are not given or distributed land like men. Even with land rights, women do not have full decision-making power over their land.

Table 7 ANOVA.

Gender Equality in Access to Land and Exercise of Land Use Rights (GA)					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	0.086	2	0.043	0.641	0.527
Within Groups	23.236	346	0.067		
Total	23.322	348			

The descriptive statistics (Table 8) show that the mean value of ethnic groups is in the range of 4.8291 to 4.8547 (strongly agree). This result means that even though there are differences in ethnic groups and differences in matriarchal and patriarchal systems, all households and individuals of ethnic minorities participating in the survey agree that ethnic minority women are currently disadvantaged in accessing land and exercising land use rights. They are not given or distributed land like men. Even with land rights, women do not have full decision-making power over their land.

Table 8 Descriptives.

Gender Equality in Access to Land and Exercise of Land Use Rights (GA)							
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		
					Lower Bound	Upper Bound	
Cham	99	4.8199	0.24935	0.02506	4.7701	4.8696	4.00 5.00
Bana	172	4.8547	0.25528	0.01947	4.8162	4.8931	4.00 5.00
H're	78	4.8291	0.27911	0.03160	4.7661	4.8920	4.00 5.00
Total	349	4.8391	0.25888	0.01386	4.8118	4.8663	4.00 5.00

3.4. Test the research hypothesis

Hypothesis testing was conducted to confirm the relationship between gender equality, land access, and land use rights exercise of ethnic minorities in Binh Dinh province. SmartPLS3 software is used to test the hypotheses in the research model. The test results are shown in Figure 2, including the adjusted R² coefficient of 2 dependent variables, namely, land access (LA) and realization of land use rights (LUR), coefficients β , and t values for PLS paths in the model. The metrics are calculated based on 5000 bootstrapping samplings. The results of the data analysis show that the adjusted R² coefficient of all dependent variables is higher than the threshold of 0.2 (in which access to land is 0.692 and realization of land use rights is 0.392), proving that the research model has a high degree of agreement with the collected data. An R² value of 0.20 is considered high in exploratory, behavioral research fields (Hair Jr et al 2021)

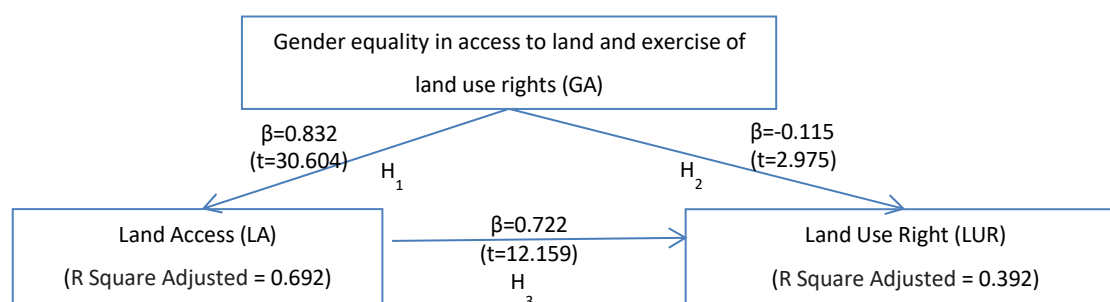


Figure 2 Hypothesis test results

3.5. Check the direct effects of a structural model

Hypothesis H1 proposes that gender equality has a substantial impact on land access. This result can be understood as strengthening gender equality will help increase land access for ethnic minorities. The results of the data analysis in Fig. 3 show that hypothesis H1 is highly accepted with a statistical significance of 1% ($t = 30.604$), and the coefficient β for the path from gender equality to land access is 0.832. Hypothesis H1 results support the conclusion in the study of (Khoi, Canh et al. 2021) about the role of gender equality in land access.

Hypothesis H2 is accepted with a statistical significance of 1% ($t = 2.975$), and the coefficient β leading from gender issues in land access to land use rights is -0.115. Hypothesis H2 assumes that the exercise of land use rights by ethnic minority women still has gender inequality (negative β coefficient). The analysis results confirm that women are not fully empowered to decide on the exercise of rights related to land parcels due to existing inequalities in community life, which is

also the conclusion of several studies related to women's land use rights (Ik Dahl et al 2005; Sewornu 2010; Nara et al 2021; Dagdeviren and Oosterbaan 2022).

Hypothesis H3 assumes that improving access to the land of ethnic minorities will improve the ability to exercise land use rights. The results from Figure 2 confirm that hypothesis H3 is accepted with a statistical significance of 1% ($t = 12,159$), and the coefficient β for the path from land access to proper land use implementation is very strong, with coefficient $\beta = 0.722$. An estimated path coefficient close to +1 indicates strong positive relationships. The positive correlation between land rights and access to land has also been confirmed in the study of (Muraoka et al 2018).

3.6. Check the indirect effects of the structural model

Hypothesis H4 tests the indirect impact of gender equality on the exercise of land use rights through the land access of ethnic minorities. A necessary condition to confirm the existence of intermediate effects is that the directly related effects must be statistically significant (Hair Jr et al 2021).

This result means that the direct impact of gender equality on land access and the impact of land access on the exercise of land use rights must be statistically significant. The results of hypothesis analyses H1 and H3 show that these two relationships are highly accepted with statistical significance at 1% (t value = 30.604 and t value = 12.159). At the same time, the results on the indirect impact of gender equality on the implementation of land use rights through the intermediate variable of land access are presented in Table 9, showing that the relationship is accepted at a statistically significant level. 1% (t value=10.086) and coefficient $\beta = 0.601$.

Table 9 also shows that the total impact (sum of direct and indirect impacts) of gender equality on the implementation of land use rights is highly accepted with statistical significance at 1%, t value = 8.070, and the coefficient β has a very high value of 0.486. The coefficient $\beta = 0.2$ is considered high for exploratory studies (Hair Jr et al 2021).

Table 9 Specific Indirect Effects and Total Effects.

Specific Indirect Effects					
	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
GA -> LA -> LUR	0.601	0.600	0.060	10.086	0.000
Total Effects					
GA -> LA	0.832	0.833	0.027	30.604	0.000
GA -> LUR	0.486	0.485	0.060	8.070	0.000
LA -> LUR	0.722	0.720	0.059	12.159	0.000

Quantitative analysis results from testing the research hypotheses have confirmed an indirect relationship between gender equality and the exercise of land use rights through access to land. The research results confirm that ensuring access to land will ensure equality for women when participating in transactions related to inheritance, transfer, donation, and conversion of land. This result is also confirmed in the conclusions of several studies by scientists in Vietnam and worldwide related to gender equality, access to land, and the exercise of land use rights (Whitehead and Tsikata 2003; Phu 2021; Komatsu et al 2022; Unger et al 2023).

4. Discussion

The research model built with three research concepts with 17 observed variables has shown that ethnic minority culture is one of the critical factors affecting gender equality in access to land and the practice of land use rights. The customs, practices, and customary laws of ethnic groups have ignored the legally recognized actual land use rights for women (women often do not have the right to decide or contribute opinions in implementing the right to convert land use rights, transfer, gift, or inheritance of land). However, the law recognizes land use rights as belonging to husband and wife for property formed after marriage (Article 33, Law on Marriage and Family 2014). As a result, the lack of absolute land ownership can quickly push ethnic minority women into a dependent and vulnerable position and become a disadvantaged society, especially widows or widowers; divorce leads to disputes between parents and brothers and sisters-in-law. Even when the law states that a wife, widow, or daughter must be divided into the family's land and property, in practice, this is often opposed by male relatives and sons of the deceased husband (Van Leeuwen 2017), resulting in their rights not being guaranteed.

Some solutions need to be implemented step by step; for example, Vietnam's law needs to continue to have more specific regulations, mainstreaming gender equality in the development of legal policies on land related to access to land and the exercise of land use rights to ensure that women, predominantly ethnic minority women, have the right to access and use land. For example, the requirement that the names of both spouses be required when recognizing land use rights for ethnic minorities is seen as an effective way to protect women from sources of insecurity related to change husband and family disputes (widows case) (Feyertag et al 2021).

A practical solution to promote gender equality in land access and land use rights exercise is the formal registration of land use rights, which is one of the main ways to promote gender equality and ensure women's rights to land (Whitehead and Tsikata 2003), primarily if the land use suitable certificate is issued in the name of both husband and wife (Ali et al 2014; Komatsu et al 2022; Unger et al 2023).

At the same time, promoting common land use rights and promoting land registration for women is a requirement from the Food and Agriculture Organization of the United Nations. Integrating gender equality into policy is essential in the United Nations Publication "Realizing Women's Rights to Land and Other Resources of Production" (UN-GGIM 2019). The publication recommends that laws, policies, and programs ensure that all land instruments integrate gender issues and promote women's effective, safe, and equitable enjoyment of their land. Recording the husband and wife's names on the certificate of land use rights also clearly shows the responsibility and role of the husband and father in the family, knowing how to share ownership and benefits from land use rights with his wife. With this study's findings and policy implications, the authors hope to play a small role in Vietnam and other developing countries to perfect land law policies for ethnic minorities toward achieving equality in land access and implementing land use rights for ethnic minority women.

5. Conclusions

The study analyzed the relationships between gender equality, land access, and land use rights exercise in an integrated model. The research results show a robust positive relationship between gender equality and the exercise of land use rights through the intermediate variable of access to the land of ethnic minorities.

The results of one-way average difference analysis ANOVA confirmed that although there are differences in ethnic groups and differences in matriarchy and patriarchy, all three ethnic groups, Cham and Bana, and Hre, both said that the access to land and exercise of land use rights by ethnic minority women is currently more disadvantaged than that of men.

Gender inequality in access to land and the exercise of land use rights has existed in the lives of ethnic minority communities. The results of the study can be considered one of the essential scientific bases for the further development of land policy by the Vietnamese government to achieve equality in land access, improve access to land and exercise land use rights for ethnic minority women.

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Ethical considerations

Not applicable.

Conflict of Interest

The authors declare no conflicts of interest.

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