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AWARENESS, ATTITUDES, AND WILLINGNESS TO PARTICIPATE IN COMMUNITY-BASED FOREST MANAGEMENT: A CASE OF SONG HINH PROTECTION FOREST, VIETNAM

[1]Le Hong Viet, [2]Tran Thi Nhat, [3]Nguyen Thi Danh Lam, [4]Van Viet Nguyen

[1]Center for Training and Fostering in Agriculture and Forestry, Dong Nai Campus, Vietnam National University of Forestry, Dong Nai 76000, Vietnam
[2,3,4]Faculty of Natural Resources & Environment, Dong Nai Campus, Vietnam National University of Forestry, Dong Nai 76000, Vietnam

[1]*lhviet@vnuf2.edu.vn,* [2]*ttnhat@vnuf2.edu.vn,* [3]*ntdlam@vnuf2.edu.vn*
[4]*nvviet@vnuf2.edu.vn*

Abstract

Community-based forest management (CBFM) has increasingly been recognized as an important approach for promoting sustainable forest governance and enhancing local community participation in forest conservation. This study aimed to assess the current state of knowledge and attitudes, and to identify the factors influencing local communities' willingness to participate in a CBFM program at the Song Hinh Protection Forest Management Board, Dak Lak Province, Vietnam. Data were collected through a sociological survey of 155 households and analyzed using a binary logistic regression model. The findings reveal a paradox between willingness and depth of awareness. Although the proportion of respondents willing to participate CBFM was very high, at 89.0%, and the vast majority expressed positive attitudes toward the role of local communities, at 89.1%, only 29.7% demonstrated a clear understanding of the program, while 51.6% possessed only superficial awareness. The binary logistic regression results indicate that marital status was the strongest predictor of willingness to participate, with Exp(β) = 58.614, followed by attitude, with Exp(β) = 22.197, and awareness, with Exp(β) = 12.349. Notably, conventional socio-economic factors, such as income, education level, and gender, did not exert a significant influence on willingness to participate in this context. Based on these findings, the study proposes several key solutions, including innovating environmental education approaches, enhancing the transparency of benefit-sharing mechanisms, and prioritizing the mobilization of core household groups. These measures are expected to transform community willingness into substantive and sustainable forest protection behavior.

Keywords*:* Attitude, Awareness, Protected forest, Willingness to participate.

1. Introduction

In recent decades, global forest resource management has undergone a profound transformation, shifting from strictly centralized, state-controlled management models toward more participatory governance approaches involving local communities and relevant stakeholders (Berkes, 2004; Chhetri, Johnsen, Konoshima, & Yoshimoto, 2013). This transition is not merely an administrative adjustment; rather, it reflects a broader sociological recognition that local communities are not only affected by forest management policies but are also central actors in the protection and sustainable use of

natural resources (Ostrom, 1990; Pretty & Smith, 2004). From the perspective of community-based natural resource management (CBNRM), meaningful community participation is a prerequisite for improving conservation effectiveness, reducing resource-related conflicts, and ensuring equity in the distribution of forest-derived benefits (Berkes, 2004; Walle & Nayak, 2022).

A growing body of international empirical research has demonstrated that when local people are empowered to participate in planning and monitoring processes, forest protection outcomes are often more effective than those achieved through strictly protected conservation models that are detached from community interests (Paudyal, Thapa, Neupane, & Kc, 2018; Walle & Nayak, 2022). This is particularly relevant in developing countries, where forests serve as an important "safety net" for the livelihoods and cultural practices of local populations. In Vietnam, forest governance has undergone substantial institutional changes over the last two decades, leading to a gradual reconfiguration of forest tenure, management responsibilities, and stakeholder participation. Policy instruments such as forestland allocation, CBFM, and payments for forest environmental services (PFES) have played an important role in creating legal and institutional conditions for local communities to become more actively involved in forest protection and development. In particular, the formal recognition of PFES in the 2017 Law on Forestry has further strengthened the policy basis for linking forest conservation with community benefits (Chi Thanh, 2022; Thanh Sang, 2021). As a result, various forms of co-management and forest protection contracting have been promoted and applied in protected areas and protection forests across Vietnam (Phung, 2019; Vinh; & Anh;, 2012). However, the outcomes achieved to date have not yet fully matched their potential. Several studies have indicated that local participation remains largely passive, being mainly confined to contract-based implementation activities such as forest patrols and forest fire prevention, whereas community voices in decision-making, monitoring, and planning processes remain relatively limited (Thanh Sang, 2021; Vinh; & Anh;, 2012). This situation reflects persistent constraints related to awareness, capacity, and the lack of substantive motivational and incentive mechanisms provided by governance agencies (Chi Thanh, 2022; Phung, 2019). To address the challenge of mobilizing local communities, it is essential to understand the psychological and cognitive factors that shape people's participation. From a behavioral theory perspective, willingness to participate is the outcome of a complex interaction between awareness and attitudes (Hoang, Khanh, & Phong, 2025; Nguyen, Nguyen, Phan, & Lee, 2023). Knowledge is regarded as a fundamental basis for shaping local people's awareness of ecosystem values, biodiversity, and legal regulations related to forests. When people have adequate understanding of the importance of protection forests in mitigating climate change and safeguarding water resources, they are more likely to develop positive attitudes toward conservation activities (Ba, 2025). Conversely, inadequate information or misconceptions about benefit-sharing policies often lead to indifference or even behaviors that negatively affect forest resources (Chi Thanh, 2022; Thuy & Chung, 2023). Empirical studies in Vietnam have also confirmed that educational attainment, life experience, and access to communication and awareness-raising programs have a

strong positive influence on local people's attitudes and willingness to contribute their efforts to forestry programs (Nguyen et al., 2023; Thanh Sang, 2021).

The Central Highlands of Vietnam, with the Song Hinh Protection Forest Management Board as a representative case, is currently facing particularly severe conservation challenges. Managing nearly 26,000 ha of forest across a complex terrain bordering several localities, the Song Hinh Protection Forest Management Board is frequently exposed to pressures arising from forestland encroachment for shifting cultivation, illegal forest product extraction, and livelihood demands among local ethnic minority communities (Dak Lak Newspaper, 2026). Although the Management Board has actively implemented forest protection contracting programs and mobilized local people not to engage in deforestation, community mobilization has not yet achieved sustainable effectiveness. Forest encroachment and degradation continue to occur in several key forest compartments, suggesting that the linkage between management authorities and local communities still contains weak points (Dak Lak Newspaper, 2026). In this context, the lack of scientific evidence on community awareness and attitudes toward forest resource management programs represents a significant research gap. This gap has made communication activities and livelihood-based interventions less responsive to the actual needs, expectations, and aspirations of local residents. Therefore, this study was conducted to systematically assess the awareness, attitudes, and willingness of local communities to participate in community-based forest management programs at the Song Hinh Protection Forest Management Board. Dak Lak Province, Vietnam.

2. Literature Review

2.1. Theoretical Framework of Community Participation in Resource Management

The concept of "participation" in forest resource management has evolved from a narrow view in which local people are regarded merely as passive beneficiaries to a broader understanding that recognizes them as active agents capable of influencing, sharing power, and participating in control, decision-making, and benefit-sharing processes (Chi Thanh, 2022; Maleknia & ChamCham, 2024). The theoretical foundation of contemporary studies on this issue is commonly grounded in the CBNRM approach. This perspective emphasizes that clearly defined empowerment and locally appropriate resource-use rules can facilitate a transition from top-down management models to more collaborative forms of co-management (Berkes, 2004; Ostrom, 1990). In this regard, community participation is considered a fundamental determinant of conservation sustainability across three interrelated dimensions: economic, social, and environmental sustainability (Savari, Eskandari Damaneh, & Eskandari Damaneh, 2020; Walle & Nayak, 2022). To explain the behavioral mechanisms underlying participation, many studies have adopted socio-psychological frameworks, particularly Ajzen's Theory of Planned Behavior (Ajzen, 1991). This theory highlights the role of attitudes, subjective norms, and perceived behavioral control in shaping behavioral intentions and, subsequently, actual

behavior (Apipoonyanon, Kuwornu, Szabo, & Shrestha, 2019; Paudyal et al., 2018). In addition, the Norm Activation Model has also been applied to clarify how awareness of consequences and personal responsibility can motivate individuals to engage in conservation activities as a form of moral obligation (Hoang et al., 2025).

2.2. The Relationship Between Awareness, Attitudes, and Participation Behavior

Awareness, is widely regarded as a critical antecedent in shaping local people's attitudes and participation behavior toward forest management (Savari et al., 2020; Thanh Sang, 2021; Thuy & Chung, 2023; Walle & Nayak, 2022). Empirical studies have shown that when local communities possess sufficient understanding of ecological values, such as watershed protection and climate change mitigation, as well as forest-related legal regulations, they are more likely to develop positive attitudes and demonstrate a greater willingness to engage in forest protection activities (Ba, 2025; Thuy & Chung, 2023). Conversely, limited access to information or misconceptions regarding benefit-sharing policies may result in indifference or even behaviors that negatively affect forest resources (Chi Thanh, 2022; Thanh Sang, 2021).

Attitude serves as a mediating factor linking knowledge to participation behavior (Bhusal, Parajuli, & Sills, 2025; Hoang et al., 2025). According to Savari et al. (2020), positive attitudes toward sustainable forest management are shaped not only by environmental awareness but also by trust in the effectiveness of management programs. Nevertheless, several studies have highlighted the existence of an attitude behavior gap (Monroe, Day, & Grieser, 2000; Robinson & Andreas, 2003). In other words, local people may express supportive attitudes toward conservation but remain unwilling or unable to participate directly because of resource constraints, opportunity costs, or livelihood pressures (Bhusal et al., 2025; Nguyen et al., 2023).

2.3. Determinants of The Level and Willingness of Participation

Previous international and Vietnamese studies have shown that community participation in forest resource management is shaped by a multidimensional set of factors. These determinants can be broadly grouped into four main categories: socio-demographic characteristics, economic and livelihood conditions, spatial and resource-related factors, and institutional and governance arrangements.

First, socio-demographic characteristics have been widely recognized as important predictors of participation. Educational attainment is often associated with better access to information, greater awareness of forest policies, and stronger decision-making capacity (Chi Thanh, 2022; Walle & Nayak, 2022). In addition, household size and available labor resources may influence the ability of households to allocate members to collective activities, such as forest patrols, tree planting, and fire prevention (Chhetri et al., 2013; Paudyal et al., 2018). Gender is also a critical dimension of participation. In many rural forest-dependent communities, women continue to face structural constraints in decision-making

processes because of gender norms, unequal access to information, and domestic responsibilities (Leskinen, 2004; Phung, 2019).

Second, economic and livelihood-related factors exert complex and sometimes context-specific effects on community participation. The degree of dependence on forest resources may increase people's motivation to participate in forest management, as forest-dependent households often have a direct interest in sustaining the resource base that supports their livelihoods (Lise, 2000; Sang, Ogata, & Yabe, 2010). However, other studies suggest that households with higher income or more diversified non-farm income sources may be better positioned to reduce extractive pressure on forests and contribute time, labor, or resources to collective management activities (Savari et al., 2020). Furthermore, economic incentive mechanisms, particularly PFES, have been identified as important instruments for encouraging more substantive forms of participation by linking conservation responsibilities with tangible household benefits (Diep & Phan, 2018; Thanh Sang, 2021).

Third, spatial and resource-related factors also influence participation decisions. Distance from residential areas to forest sites is commonly found to be negatively associated with participation because greater distance increases travel time, monitoring costs, and the opportunity cost of engagement (Tadesse, Woldetsadik, & Senbeta, 2017; Walle & Nayak, 2022). Moreover, the condition and quality of forest resources may affect the perceived benefits of participation. Forest areas with higher ecological quality and greater provision of ecosystem services are more likely to attract community interest and encourage local involvement in protection and management activities (Chhetri et al., 2013).

Finally, institutional and governance factors play a decisive role in shaping trust, legitimacy, and long-term commitment among local communities. Secure land-use rights, including formal land certificates, can strengthen people's sense of ownership and responsibility toward forest resources (Que, Nam, & Bien, 2018). Likewise, transparency in benefit-sharing mechanisms is essential for building trust between communities and forest management authorities (Diep & Phan, 2018). In addition, technical support, communication quality, and the administrative capacity of forest management boards are crucial for sustaining local engagement and transforming nominal participation into meaningful participation in practice (Bhusal et al., 2025; Thanh Sang, 2021).

3. Materials and Methods

3.1. Study Area

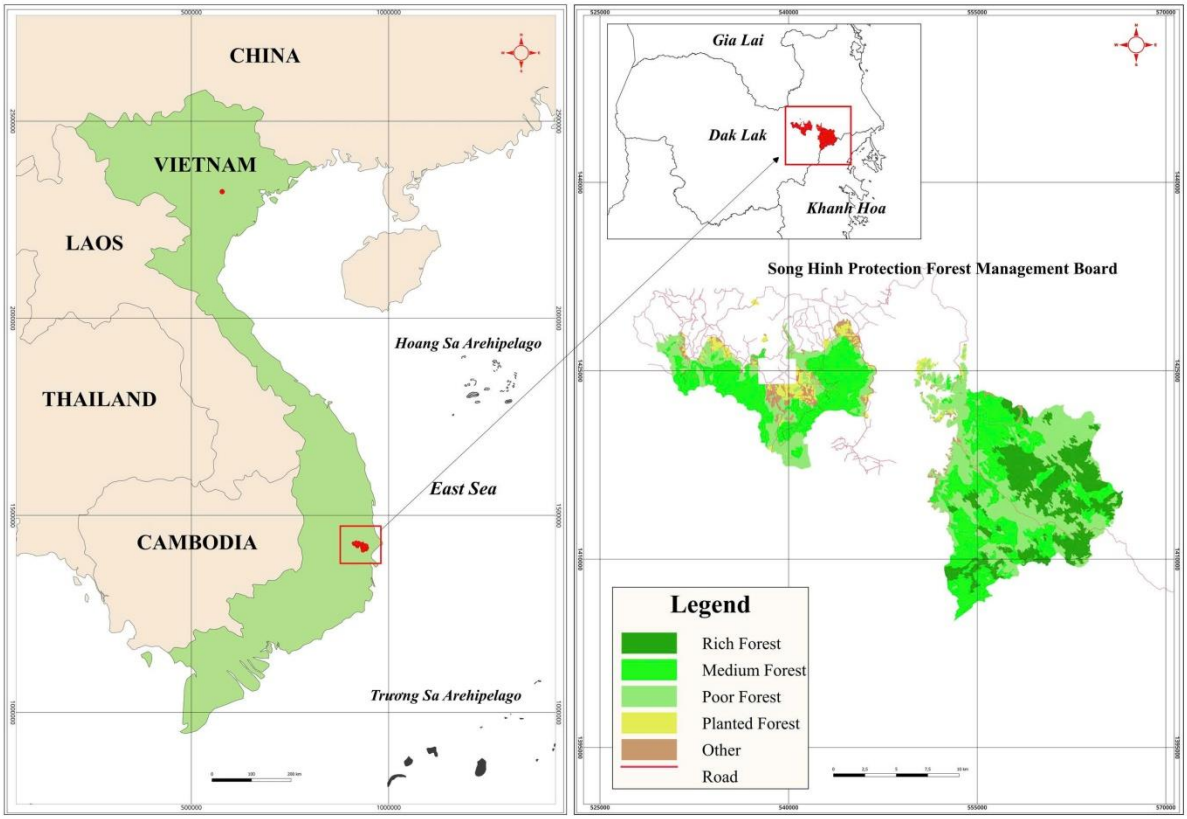
The study was carried out in the forest landscape administered by the Song Hinh Protection Forest Management Board, Dak Lak Province, Vietnam (See Figure 1). This management unit oversees nearly 26,000 ha of protection forest, an area that performs multiple ecological functions for the surrounding region (Dak Lak Newspaper, 2026). In particular, the forest contributes to watershed regulation, biodiversity conservation, soil and water protection, and the stabilization of ecological processes in the Central Highlands. These functions make the area not

only important for conservation but also closely linked to the livelihood security of nearby rural communities. The Song Hinh protection forest is located in a relatively complex mountainous landscape, where forest compartments are distributed across areas with difficult terrain and uneven accessibility (Dak Lak Newspaper, 2026). Human settlements around the forest are generally dispersed, and many households live in close proximity to forest boundaries. This spatial pattern creates both opportunities and challenges for forest governance. On the one hand, local communities can play an important role in detecting forest disturbances and supporting protection activities. On the other hand, the remoteness of several forest areas increases the cost and difficulty of regular monitoring, patrols, and law enforcement.

The study area has also been exposed to growing socio-economic pressures. Agricultural expansion, shifting cultivation, encroachment on forestland, illegal extraction of forest products, and livelihood dependence among some local households have placed increasing stress on forest resources. These pressures are particularly difficult to manage because they are closely associated with local development needs, limited livelihood alternatives, and the dependence of some ethnic minority communities on land and forest-based resources. As a result, forest protection in Song Hinh cannot rely solely on administrative enforcement, but requires stronger cooperation between management authorities and local residents.

In recent years, the Song Hinh Protection Forest Management Board has implemented several community-oriented forest protection activities to enhance local involvement. These activities include forest patrolling, forest fire prevention, tree planting, forest tending, and collaborative monitoring with forest rangers and local authorities. Nevertheless, the effectiveness of such initiatives depends on whether local people possess adequate knowledge of forest management programs, maintain positive attitudes toward conservation, and are willing to participate in collective forest protection activities. Therefore, the Song Hinh protection forest represents a relevant case for examining community participation behavior in forest resource management. Its combination of ecological importance, governance challenges, livelihood pressures, and ongoing community-based initiatives provides a suitable context for identifying the factors that shape local people’s willingness to participate in forest protection and conservation programs.

Figure 1. Study Area



Source: Prepared by the Authors

3.2. Data Collection

Primary data were collected through a household survey conducted among residents living in communities adjacent to the forest areas managed by the Song Hinh Protection Forest Management Board, Dak Lak Province, Vietnam. A structured questionnaire was used to collect standardized information on respondents' participation in forest resource management, socio-economic characteristics, awareness, attitudes, and willingness to participate.

The questionnaire was developed through a multi-stage process. First, the initial items were derived from previous studies on CBFM, environmental awareness, and participation behavior. The draft questionnaire was then reviewed through interviews with five experts from the Vietnam National University of Forestry (Dong Nai Campus) and forestry practitioners from the Song Hinh Protection Forest Management Board, to ensure its theoretical relevance and suitability for the local context. Based on their feedback, several items were revised to improve clarity and consistency. Subsequently, a pilot survey was conducted with local residents sharing similar characteristics with the target population. The final questionnaire was written in Vietnamese and consisted of three sections. The first section presented the study objectives and informed consent information. The

second section collected data on the awareness, attitudes, and willingness of local people to participate in the CBFM. The third section gathered socio-demographic and economic information, such as gender, age, marital status, education, household size, income, occupation, and length of residence in the locality. The minimum sample size was determined using Cochran (1977) (Nguyen & Phan, 2025) formula for estimating population proportions:

$$n = \frac{z^2 pq}{e^2}, \qquad (1)$$

where (n) denotes the required sample size, (z) is the standard normal value corresponding to the selected confidence level, (p) represents the expected proportion of the population possessing the attribute of interest, (q = 1 - p), and (e) is the acceptable margin of error. In this study, a 95% confidence level was adopted, corresponding to (z = 1.96). Since no prior estimate was available regarding the proportion of local residents willing to participate in forest resource management, maximum variability was assumed, with (p = 0.5) and (q = 0.5). With a margin of error of 8%, the minimum sample size was calculated as follows:

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{(0.08)^2} = 150.$$

Accordingly, the required minimum sample size was approximately 150 respondents. To improve the reliability of the dataset and provide sufficient observations for subsequent regression analysis, 160 households were initially targeted for the official survey.

A random sampling approach was employed to enhance sample representativeness. Respondents were proportionally allocated across villages within the study area to ensure that different residential clusters located near the protection forest were included.

Ethical considerations were strictly followed throughout the survey process. Prior to each interview, respondents were informed about the study objectives, the voluntary nature of participation, and their right to decline any question or withdraw from the survey at any stage. Informed consent was obtained before data collection. All information provided by respondents was treated confidentially, anonymized during data processing, and used solely for academic research purposes. In total, 160 questionnaires were administered during the official household survey.

After data screening, five questionnaires were excluded because of incomplete responses or inconsistencies in key variables. As a result, 155 valid questionnaires were retained for statistical analysis, yielding an effective response rate of 96.9%. The final sample exceeded the minimum sample size estimated by Cochran's formula and was considered appropriate for descriptive statistics and binary logistic regression analysis.

3.3. Data Analysis

Data analysis was conducted in several stages. First, all completed questionnaires were screened to identify missing values, inconsistent responses, and potential coding errors. After data cleaning, the valid responses were coded and entered into IBM SPSS Statistics version 26.0 statistical software for analysis.

Descriptive statistics, including frequencies and percentages were used to summarize respondents' socio-demographic characteristics, levels of awareness, attitudes, and participation in forest resource management activities.

Because the dependent variable of this study was binary, a binary logistic regression model was employed to identify the factors influencing local people's willingness to participate in forest resource management. The dependent variable was coded as 1 if the respondent was willing to participate in CBFM and 0 otherwise. Two key explanatory variables were ordinally coded to capture the levels of awareness and attitudes of local people of community-based forest resource management: Awareness was coded as 0 = Unaware (don't know), 1 = Somewhat aware, and 2 = Clearly aware; Attitudes was coded as 1 = Normal, 2 = Importance, and 3 = Very important.

To examine the factors influencing local participation in CBFM, a Binary Logistic Regression model was employed. Logistic regression is appropriate when the dependent variable is dichotomous and allows estimation of the probability that an individual participates in forest management activities as a function of a set of explanatory variables (Hosmer Jr, Lemeshow, & Sturdivant, 2013; Nguyen & Phan, 2025). The model is specified as follows:

$$\ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k \,, \qquad (2)$$

where (P) denotes the probability that a respondent participates in forest resource management; β_0 is the intercept; β_k represents the estimated regression coefficients; and X_k denotes the explanatory variables included in the model.

The independent variables comprised key socio-economic and demographic characteristics, including gender (0 = male, 1 = female), marital status (0 = unmarried, 1 = married), education level, household income, and age were measured as ordered categorical variables.

The regression results were interpreted using regression coefficients, statistical significance levels, and odds ratios. In particular, the odds ratio, reported as Exp(β), was used to assess the magnitude and direction of the effect of each predictor. An Exp(β) value greater than 1 indicates that the variable increases the odds of willingness to participate, whereas an Exp(β) value less than 1 indicates a negative association with willingness to participate.

Model fit was assessed using the Omnibus Test of Model Coefficients, the Hosmer–Lemeshow goodness-of-fit test, pseudo-(R^2) statistics, and the overall classification accuracy of the model. Statistical significance was evaluated at conventional levels, with particular attention to variables significant at the 5% level. These analytical procedures allowed the study to identify the key determinants of local residents' willingness to participate in community-based forest resource management.

4. Results

4.1. Socio-economic Characteristics of Respondents

The socio-demographic profile of the 155 valid respondents shows that the sample was predominantly male, with men accounting for 74.2% and women representing 25.8%. Most respondents were married, representing 94.2% of the total sample (Table 1). Regarding age, respondents were mainly concentrated in the working-age groups. The largest proportion belonged to the 30–39 age group (32.9%), followed by those aged 40–49 years (32.0%) and 20–29 years (21.3%). Respondents aged 50–59 years accounted for 11.0%, while those aged 60 years and above represented only 1.9%. In terms of education, respondents had relatively diverse educational backgrounds. The largest share had completed university education or above (30.3%), followed by high school education (27.1%), college or vocational education (18.7%), and secondary education (16.8%). Only 7.1% of respondents had elementary education or lower. Occupationally, employees constituted the largest group of respondents (35.5%), followed by government employees (23.9%), farmers (17.4%), other occupations (12.9%), and self-employed respondents (10.3%). Monthly income also varied across respondents. The most common income group was VND 4,000,000–6,000,000 per month (29.0%), followed by VND 6,000,000–8,000,000 (26.5%) and VND 8,000,000–10,000,000 (17.4%). Lower-income households earning below VND 4,000,000 accounted for 17.4%, while 9.7% reported monthly income above VND 10,000,000.

Table 1. Demographic Characteristics of Respondents

Characteristics		Frequency	%
Gender	Male	115	74.2
	Female	40	25.8
Marital status	Single	9	5.8
	Married	146	94.2
Age (years)	20 – 29	33	21.3
	30 – 39	51	32.9
	40 – 49	51	32.9
	50 – 59	17	11.0
	≥60	3	1.9
Educational levels	Elementary school or lower	11	7.1
	Secondary	26	16.8
	High school	42	27.1
	College/Vocational education	29	18.7
	University or above	47	30.3
Occupation	Farmers	27	17.4
	Employees	55	35.5

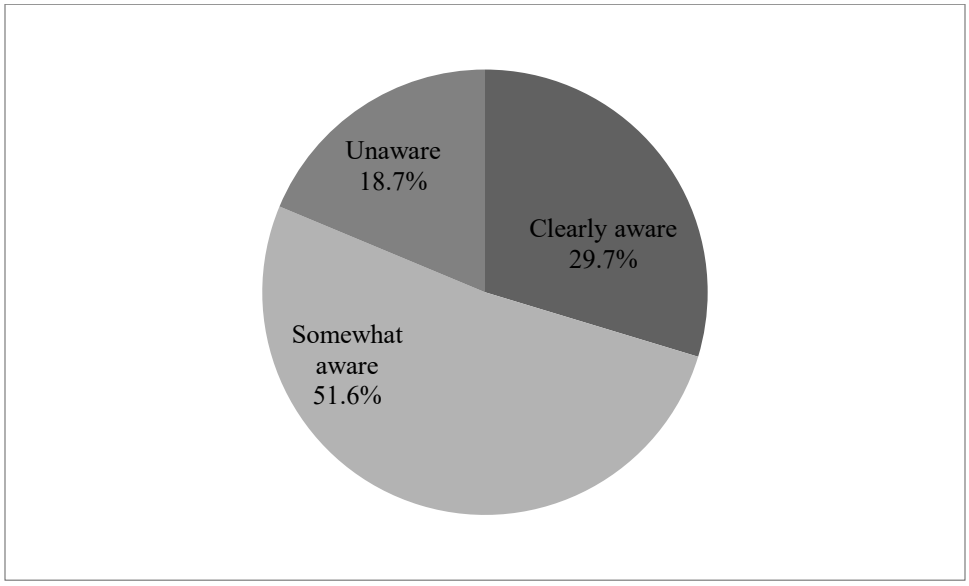
	Government employees	37	23.9
	Self-employed	16	10.3
	Others	20	12.9
Monthly income (VND)	Less than 2,000,000	9	5.8
	2,000,000 – 4,000,000	18	11.6
	4,000,000 – 6,000,000	45	29.0
	6,000,000 – 8,000,000	41	26.5
	6,000,000 – 8,000,000	27	17.4
	Above 10,000,000	15	9.7
	Total	155	100

VND: Vietnam Dong (1 USD ≈ 26,077 VND) (data from The State Bank of Vietnam on January 2026).

4.2. Community Awareness Toward Community-Based Forest Management Programs

Figure 2 show that community awareness of CBFM programs varied across respondents. Overall, 81.3% of respondents had some level of awareness of these programs, while 18.7% reported that they were unaware. Among the respondents, the largest proportion belonged to the "somewhat aware" group, accounting for 51.6%. This indicates that more than half of the surveyed residents had heard of or had limited awareness about CBFM programs, but their understanding was not yet clear or comprehensive. Meanwhile, 29.7% of respondents reported being clearly aware of the programs. This group represents those with a more definite understanding of CBFM-related activities and information. By contrast, 18.7% of respondents were unaware of CBFM programs. Although this was the smallest group, the result indicates that a certain proportion of local residents had not yet been reached by information or communication activities related to CBFM. The findings suggest that community awareness in the study area was mainly concentrated at the partial-awareness level. While most respondents had been exposed to CBFM-related information, the proportion of respondents with clear awareness remained relatively limited.

Figure 2. Community Awareness Toward CBFM Programs

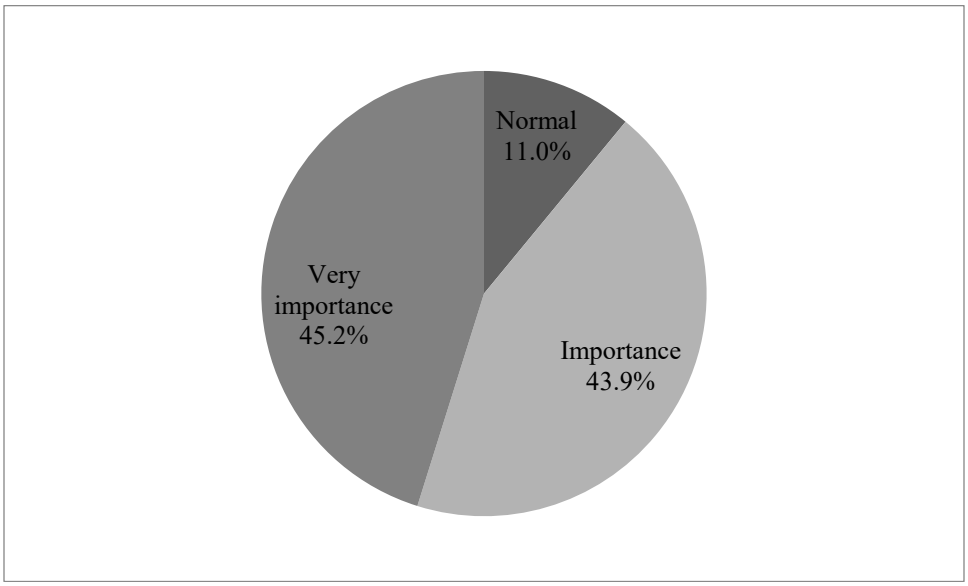


Source: Survey Data Collected by The Authors (2026)

4.3. Community Attitudes Regarding The Role of Their in CBFM

The results in Figure 3 show that a very high percentage of local people have a positive attitude and highly appreciate the role of the community in forest resource management. The group of opinions considering the role of the community as "Important" and "Very Important" reached 89.1%. This reflects a strong shift in ecological awareness and thinking about ownership of natural resources among residents in the Song Hinh Protection Forest Management Board.

Figure 3. Community Attitudes Toward CBFM Programs

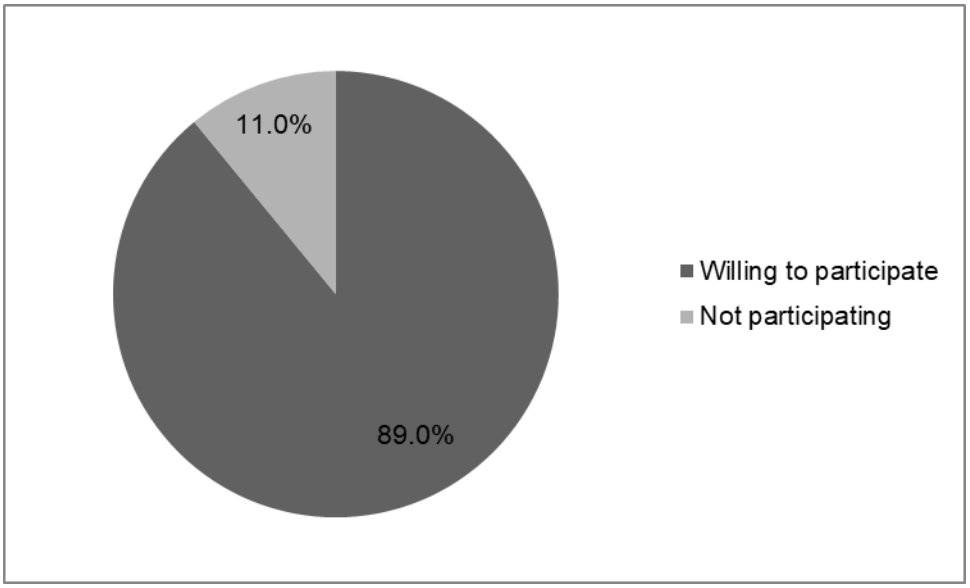


Source: Survey Data Collected by The Authors (2026)

4.3. Community's Willingness to Participate in CBFM

Figure 4 shows a high level of willingness among local residents to participate in CBFM. Specifically, 89.0% of respondents expressed willingness to participate, whereas only 11.0% reported that they were not willing to participate. This finding indicates that most respondents showed a positive orientation toward involvement in forest management activities. The relatively small proportion of unwilling respondents suggests that resistance to participation was limited within the surveyed community.

Figure 4. The community's willingness to participate in CBFM



Source: Survey Data Collected by The Authors (2026)

4.4. Factors Influencing Community's Willingness to Participate in CBFM

The binary logistic regression results in Table 2 indicate that the overall model was statistically significant, with a Chi-square value of 63.487 ($df = 7$, $p < 0.001$). This result suggests that the set of independent variables included in the model was significantly associated with the dependent variable, namely local residents' willingness to participate in CBFM.

Regarding explanatory power, the Nagelkerke R^2 value was 67.3%, indicating that the model explained a substantial proportion of the variation in respondents' willingness to participate. This level of explanatory power can be considered relatively strong in the context of social research on CBFM. The goodness-of-fit of the model was further assessed using the Hosmer–Lemeshow test. The test produced a p-value of 0.318, which was greater than the conventional significance level of 0.05. This indicates that there was no statistically significant difference between the observed and predicted values, suggesting that the model

fitted the survey data adequately. In addition, the model achieved an overall classification accuracy of 76.8%. This means that the model correctly classified respondents' willingness or unwillingness to participate in 76.8% of the observed cases, reflecting an acceptable level of predictive performance.

With respect to individual predictors, marital status had the strongest effect on willingness to participate (Exp(β) = 58.614, p = 0.020). This indicates that marital status was a key factor distinguishing respondents who were willing to participate from those who were not. Attitudes were the second most influential predictor (Exp(β) = 22.197, p = 0.001), suggesting that respondents with more positive attitudes toward CBFM were more likely to express willingness to participate. Awareness also had a statistically significant positive effect (Exp(β) = 12.349, p = 0.001), indicating that respondents with higher awareness of CBFM programs had greater odds of being willing to participate. By contrast, gender, educational level, income, and age were not statistically significant predictors in the model. This suggests that, within the surveyed sample, willingness to participate was more strongly associated with marital status, attitudes, and awareness than with conventional socio-demographic characteristics.

Table 2. Factors Influencing Community Willingness to Participate in CBFM rograms

Factors	β	Exp(β)	p-value
Awareness (0 = Unaware; 1 = Somewhat aware; 2 = Clearly aware)	2.514	12.349	0.001
Attitudes (1 = Normal; 2 = Importance; 3 = Very importance)	3.100	22.197	0.001
Gender (0 = Male; 1 = Female)	-0.158	0.854	0.857
Marital status (0 = Single; 1 = Married)	4.071	58.614	0.020
Education (ordinal variable)	0.452	1.571	0.283
Income (ordinal variable)	-0.237	0.789	0.418
Age (ordinal variable)	0.564	1.757	0.270
Constant	-14.252	0.000	0.002
-2LL	43.723 (χ^2 = 63.487, df = 7, p < 0.001)		
Cox & Snell R Square	33.6%		
Nagelkerke R^2	67.3%		
Hosmer & Lemeshow test	p = 0.318		
Classification accuracy	76.8%		

Note: Awareness means community awareness toward CBFM; Attitudes mean community attitudes toward CBFM.

5. Discussions

The findings of this study provide important insights into the behavioral foundations of community participation in CBFM at the Song Hinh Protection Forest Management Board. Overall, the results indicate a favorable social and psychological context for participatory forest governance, as the majority of respondents perceived the role of local communities as important or very important and expressed a high willingness to participate in CBFM. This suggests that local residents do not view forest management solely as the responsibility of state agencies, but increasingly recognize their own role in conserving forest resources that are closely linked to livelihood security, watershed protection, and environmental stability. From the perspective of the Theory of Planned Behavior, such positive attitudes can be regarded as a key antecedent of behavioral intention, helping to explain the high level of willingness observed in the study area (Apipoonyanon, Szabo, Kuwornu, & Ahmad, 2019). This finding is consistent with previous studies showing that when local people recognize the ecological and livelihood benefits of forests, they are more likely to support and engage in participatory forest management initiatives (Ba, 2025; Chi Thanh, 2022; Paudyal et al., 2018).

However, the results also reveal that positive attitudes and willingness do not automatically imply substantive participation. A small but notable proportion of respondents still perceived the role of local communities in CBFM as only normal (11.0%) and reported a limited willingness to participate (11.0%). These findings suggest the persistence of barriers related to limited empowerment, unclear benefit-sharing arrangements, opportunity costs, and insufficient involvement in decision-making processes. Similar challenges have been reported in other community-based forest management contexts, where local people often support conservation objectives but remain passive participants when they are treated primarily as labor providers rather than genuine co-management partners (Husseini, Kendie, & Agbesinyale, 2015; Phung, 2019; Vinh; & Anh;, 2012). This interpretation was further supported by interview evidence. One respondent stated that "*the lack of adequate financial support has caused some households to be reluctant to participate in CBFM activities or to underestimate the importance of community involvement in CBFM programs.*" Therefore, the high willingness identified in this study should be viewed as a potential resource for collective action, rather than as evidence that effective participation has already been achieved.

The binary logistic regression results further clarify the factors that shape this willingness. Among the seven explanatory variables, marital status, attitudes, and awareness were statistically significant predictors, whereas gender, education, income, and age were not. The strong effect of marital status suggests that married respondents may have greater concern for household livelihood stability, long-term environmental security, and intergenerational well-being, making them more inclined to support forest protection. In addition, the significant influence of attitudes confirms

that people who perceive community participation as necessary and meaningful are more likely to express willingness to participate. Awareness also plays an important role, indicating that clear awareness of forest management programs, rights, responsibilities, and benefits can reduce uncertainty and strengthen trust in participatory arrangements. These results are consistent with behavioral and community-based resource management studies, which emphasize that participation is shaped not only by material conditions but also by cognitive, attitudinal, and social factors (Savari et al., 2020; Subedi & Timilsina, 2016; Walle & Nayak, 2022).

A noteworthy contribution of this study is that conventional socio-economic variables, including gender, education, income, and age, did not significantly influence willingness to participate in the Song Hinh context. This suggests that participation intention may be relatively broad-based across different demographic and economic groups, provided that local residents possess adequate awareness and positive attitudes. This finding corroborates the conclusions of Bhusal et al. (2025), who emphasized that traditional socio-economic characteristics, including gender and educational attainment, do not consistently predict participation in CBFM. Although previous studies have often identified income, education, or gender as important determinantsof community participation (Chhetri et al., 2013; Chi Thanh, 2022; Diep & Phan, 2018; Tadesse et al., 2017), the present findings highlight the context-specific nature of participatory forest governance. In Song Hinh, strengthening participation should therefore focus less on selecting participants based on socio-economic characteristics and more on improving the quality of engagement through awareness raising, attitude formation, trust building, transparent benefit-sharing, and greater community involvement in planning and monitoring processes. In this sense, transforming willingness into sustained forest protection behavior requires a shift from implementation-oriented participation toward substantive co-management, in which local communities are recognized as active partners in forest governance rather than merely as labor providers for state-led protection activities.

6. Conclusions and Policy Recommendations

6.1. Conclusion

This study provides empirical insights into the current state of community awareness and behavioral motivation toward CBFM programs at the Song Hinh Protection Forest Management Board. The findings reveal a notable paradox between behavioral intention and depth of awareness. Although the proportion of local residents willing to participate was very high, at 89.0%, only 29.7% of respondents reported a clear understanding of the program. The majority of the community, accounting for 51.6%, had only superficial awareness of CBFM, which may increase the likelihood of passive participation or participation limited to contractual forest protection activities. Nevertheless, local people's attitudes toward the role of community participation were highly positive, with 89.1% considering it important or very important. This indicates the existence of favorable social capital for strengthening forest conservation efforts.

The binary logistic regression results further confirmed that willingness to participate was not significantly determined by conventional socio-economic factors, such as income, education, or gender. Instead, it was primarily shaped by psychological factors and household structure. Specifically, marital status exerted the strongest influence on willingness to participate, followed by attitudes, and awareness. These findings suggest that, in the Song Hinh context, once local residents develop positive attitudes and clearly understand their rights and benefits, they are more likely to be willing to contribute to CBFM, regardless of their socio-economic background.

6.2. Policy Implications

The high level of willingness to participate among local residents needs to be translated into sustained and meaningful forest protection behavior through more targeted governance interventions. To achieve this, communication and environmental education should move beyond one-way policy dissemination toward interactive approaches, such as community dialogues, practical training sessions, and village-based learning activities. In addition, local governments should institutionalize mechanisms that enable communities to participate more actively in planning, monitoring, and evaluating forest management activities. At the national level, policymakers should strengthen legal frameworks that support transparent and equitable benefit-sharing arrangements, particularly under PFES and other community-based conservation programs. Financial incentives should be linked with measurable conservation outcomes to increase local commitment and accountability. Furthermore, greater investment in livelihood diversification programs, including agroforestry, sustainable non-timber forest product development, and community-based ecotourism, would help reduce pressure on forest resources while improving household welfare. Such measures can contribute to transforming community willingness into long-term and meaningful participation in forest governance. These activities should be tailored to different groups of residents, particularly those with limited or unclear awareness of CBFM programs, so that they can better understand their rights, responsibilities, benefit-sharing mechanisms, and roles as active forest stewards. At the same time, community mobilization should prioritize potential core groups, especially married households and long-term residents, who are more likely to have stable social ties and stronger attachment to local forest resources. The involvement of respected individuals and influential community members may also generate positive spillover effects by encouraging wider participation among other households. In addition, forest protection programs should also be linked with livelihood development models, such as agroforestry or the cultivation of medicinal plants under forest canopies, to help local residents recognize the practical connection between conservation and household income improvement.

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During the preparation of this work, the authors used ChatGPT in order to improve language and readability. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Bibliography

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes, 50*(2), 179-211.

Apipoonyanon, C., Kuwornu, J. K. M., Szabo, S., & Shrestha, R. P. (2019). Factors influencing household participation in community forest management: evidence from Udon Thani Province, Thailand. *Journal of Sustainable Forestry, 39*(2), 184-206. doi:10.1080/10549811.2019.1632211

Apipoonyanon, C., Szabo, S., Kuwornu, J. K. M., & Ahmad, M. M. (2019). Local participation in community forest management using theory of planned behaviour: evidence from Udon Thani Province, Thailand. *The European Journal of Development Research, 32*(1), 1-27. doi:10.1057/s41287-019-00219-1

Ba, Đ. C. (2025). The role of the community in protecting and sustainably utilizing natural resources in Cham Chu nature reserve, Yen Thuan commune, Ham Yen district, Tuyen Quang province. *CTU Journal of Science, 61*, 1-9. doi:https://doi.org/10.22144/ctujos.2025.052

Berkes, F. (2004). Rethinking Community-Based Conservation. *Conservation Biology, 18*(3), 621-630. doi:10.1111/j.1523-1739.2004.00077.x

Bhusal, P., Parajuli, R., & Sills, E. O. (2025). What drives participation in community-based forest management? Insights from a global review. *Ambio*, 1-17.

Chhetri, B. B. K., Johnsen, F. H., Konoshima, M., & Yoshimoto, A. (2013). Community forestry in the hills of Nepal: Determinants of user participation in forest management. *Forest Policy and Economics, 30*, 6-13. doi:10.1016/j.forpol.2013.01.010

Chi Thanh, N. (2022). Determinants of the level of participation in protection forest management Of ethnic minorities in Binh Dinh province. *Journal of Economics and Development, T. 304 S. 2*, 45 - 54.

Cochran, W. G. (1977). *Sampling Techniques* (3nd ed.). New York: John Wiley and Sons.

Dak Lak Newspaper. (2026). Giữ màu xanh rừng giáp ranh ở Sông Hinh. Retrieved from https://baodaklak.vn/van-hoa-xa-hoi/202605/giu-mau-xanh-rung-giap-ranh-o-song-hinh-4e041b1/

Diep, T. T., & Phan, T. T. N. (2018). Determinants of Households' Participation in Forest Management, Protection and Development in Tra Vinh Province. *Vietnam J. Agri. Sci., 16*(12), 1112-1119.

Hoang, T. Q., Khanh, H. L. P., & Phong, N. T. (2025). Production, Consumption, and Factors Affecting Community Participation in Conservation of Medicinal Plants: A Case Study in Thuong Lo Commune, Nam Dong District, Thua Thien Hue Province. *Vietnam J. Agri. Sci., 23*(1), 76-85.

Hosmer Jr, D. W., Lemeshow, S., & Sturdivant, R. X. (2013). *Applied logistic regression*: John Wiley & Sons.

Husseini, R., Kendie, S. B., & Agbesinyale, P. (2015). Community participation in the management of forest reserves in the Northern Region of Ghana. *International Journal of Sustainable Development & World Ecology, 23*(3), 245-256. doi:10.1080/13504509.2015.1112858

Leskinen, L. A. (2004). Purposes and challenges of public participation in regional and local forestry in Finland. *Forest Policy and Economics, 6*(6), 605-618. doi:10.1016/s1389-9341(03)00009-1

Lise, W. (2000). Factors influencing people's participation in forest management in India. *Ecological economics, 34*(3), 379-392.

Maleknia, R., & ChamCham, J. (2024). Participatory intention and behavior towards riparian peri-urban forests management; an extended theory of planned behavior application. *Front Psychol, 15*, 1372354. doi:10.3389/fpsyg.2024.1372354

Monroe, M. C., Day, B. A., & Grieser, M. (2000). GreenCOM weaves four strands. In D. Brian & M. Martha (Eds.), *Environmental education and communication for a sustainable world*.

Nguyen, V. V., Nguyen, H. T. T., Phan, T. T. T., & Lee, C.-H. (2023). Determinants of locals' willingness to participate in human–elephant conflict management: Evidence from Dong Nai Biosphere Reserve, Vietnam. *Trees, Forests and People, 14*, 100435. doi:https://doi.org/10.1016/j.tfp.2023.100435

Nguyen, V. V., & Phan, T. T. T. T. (2025). Community perception of Human–Elephant Conflict and conservation attitudes in the Dong Nai Biosphere Reserve, Vietnam. *Sociae Polites, 26*(2), 114-125. doi:https://doi.org/10.33541/sp.v26i2.7627

Ostrom, E. (1990). Governing the commons: The evolution of institutions for collective action. *Cambridge University Pres*.

Paudyal, R., Thapa, B., Neupane, S. S., & Kc, B. (2018). Factors Associated with Conservation Participation by Local Communities in Gaurishankar Conservation Area Project, Nepal. *Sustainability, 10*(10). doi:10.3390/su10103488

Phung, T. Y. (2019). Gender and social inclusion in sustainable forest management. *The Vietnam Journal of Science and Technology, 61*(10).

Pretty, J., & Smith, D. (2004). Social Capital in Biodiversity Conservation and Management. *Conservation Biology, 18*(3), 631-638. doi:10.1111/j.1523-1739.2004.00126.x

Que, P. T., Nam, P. P., & Bien, N. N. (2018). COMMUNITY FOREST MANAGEMENT (CFM) IN HOA BINH PROVINCE: STATUS AND SOLUTIONS. *Journal of Forestry Science and Technology*(5), 183-192.

Robinson, L., & Andreas, G. (2003). *Enabling ecoaction: a handbook for anyone working with the public on conservation*. Retrieved from Humane Society International, WWF Australia, World Conservation Union, Sydney:

Sang, D. T., Ogata, K., & Yabe, M. (2010). Contribution of Forest Resources to Local People's Income : A Case Study in Cat Tien Biosphere Reserve, Vietnam. *Journal of the Faculty of Agriculture, Kyushu University, 55*(2), 397-402. doi:10.5109/18857

Savari, M., Eskandari Damaneh, H., & Eskandari Damaneh, H. (2020). Factors influencing local people's participation in sustainable forest management. *Arabian Journal of Geosciences, 13*(13). doi:10.1007/s12517-020-05519-z

Subedi, M. R., & Timilsina, Y. P. (2016). Evidence of User Participation in Community Forest Management in the Mid-hills of Nepal: A Case of Rule Making and

Implementation. *Small-scale Forestry, 15*(2), 257-270. doi:10.1007/s11842-015-9321-y

Tadesse, S., Woldetsadik, M., & Senbeta, F. (2017). Forest users' level of participation in a participatory forest management program in southwestern Ethiopia. *Forest Science and Technology, 13*(4), 164-173. doi:10.1080/21580103.2017.1387613

Thanh Sang, D. (2021). Participation of ethnic minorities in natural forest management: Cat Tien National Park, Vietnam case study. *Agriculture and Natural Resources, Volume 55 issue 2*. doi:10.34044/j.anres.2021.55.2.16

Thuy, P. T. T., & Chung, D. K. (2023). Community Awareness and Participation in Mangrove Forest Protection and Development in Giao Thuy District, Nam Dinh Province. *Vietnam J. Agri. Sci., 21*(4), 465-476.

Vinh;, L. Q., & Anh;, N. P. (2012). Assesment of the effect of community forest mangement in Phu Loc district, Thua Thien Hue Province. *Hue University Journal of Science: Agriculture and Rural Development, 75*(6), 229 - 240. doi:https://doi.org/10.26459/jard.v75i6.3175

Walle, Y., & Nayak, D. (2022). Factors determining the participation of natural resource cooperative members in forest management: A study of dry forest area in Ethiopia. *Trees, Forests and People, 8*. doi:10.1016/j.tfp.2022.100241