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Factors affecting incomes of ethnic minority households: a case study in Khanh Vinh district, Khanh Hoa province

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Abstract

This study aims to determine the factors affecting the incomes of poor ethnic minority households (EMHs) in Khanh Vinh district, Khanh Hoa province by applying an econometric model to analyze surveyed data from 150 samples. The research results found that the influential factors include ethnic characteristics, household size, number of livelihood activities, leisure time during the year, and time to access productive land. The results of this study provide more empirical evidence on the factors affecting the income of EMHs in Vietnam in general and in Khanh Hoa province in particular. By analyzing these factors in Khanh Vinh district, Khanh Hoa province, the study enriches the literature on poverty and livelihoods of the EMHs community. It provides valuable information for policymakers and practitioners in designing effective programs to improve household incomes and develop sustainable livelihoods for EMHs in this area.

Keywords: Income, Households, Ethnicity, Khanh Vinh, Vietnam

1. Introduction

The Party and State have significantly emphasized the socio-economic progress of mountainous regions. As a result, numerous guidelines, policies, programs, and projects dedicated to developing these areas were introduced. Over the years, extensive efforts have been made to execute these initiatives, leading to substantial improvements in infrastructure and the transformation of rural and mountainous landscapes. Consequently, a solid foundation for

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further development has been established. The state budget investment is relatively significant for mountainous areas. However, the socio-economic situation in the mountainous regions of Vietnam is facing many difficulties.

Khanh Vinh district of Khanh Hoa province is an area where many ethnic minority communities live and is one of the areas considered to have many difficulties. In recent years, amidst development and economic restructuring, the province and government have consistently shown deep concern for addressing social security issues, particularly poverty reduction. Comprehensive and effective policies and projects aimed at reducing poverty have been implemented. From 2016 to 2018, the government of Khanh Hoa province successfully lifted 12,357 households out of poverty, resulting in a decrease of 4.37% in the poverty rate and an average annual reduction of nearly 1.58%. However, despite these efforts, the poverty rate in Khanh Vinh district remains persistently high, especially in areas inhabited by ethnic minorities. Currently, the poverty rate in Khanh Vinh district is 32.88% (Pham *et al.*, 2020).

Therefore, finding practical, fundamental, and long-term solutions for ethnic minority communities, especially those in Khanh Vinh district, Khanh Hoa province, becomes a significant challenge. The aim is to enhance their livelihoods, escape poverty, address poverty-related issues, access new opportunities, and benefit from international economic integration in this region. This study seeks to analyze the influence of livelihood activities as one of the main factors on incomes for ethnic minority households (EMHs) in Khanh Vinh district, Khanh Hoa province.

There have been some relevant studies on the factors affecting the income of EMH in Vietnam from different regions, such as those of Van de Walle *et al.* (2001), MOLISA (2015), Nguyen *et al.* (2019), Hoang and Nguyen (2020), Tran *et al.* (2021). However, a study examining the determinants of ethnic household income in Khanh Vinh district is still missing; therefore, this research will fill this gap. This study uses quantitative methods with a multivariate regression model to assess the factors influencing the EMH income in Khanh Vinh district, Khanh Hoa province. This study hopes to provide evidence for management agencies and local authorities to form practical solutions to improve their regions' incomes, increase efficiency, and ensure the attainment of developmental goals.

This study is structured as follows. Section 1 assesses key research related to the research topic as a background for building a research model in section 2. Section 3 presents the research method in details. The results and discussion are shown in section 4. Finally, the conclusion and policy recommendations are proposed in section 5.

2. Literature review

Numerous studies have examined how socioeconomic factors influence household incomes and poverty reduction, particularly within EMH in various countries (Van de Walle *et al.*, 2001; MOLISA, 2015; Hoang and Nguyen, 2020).

Despite experiencing significant economic growth and substantial poverty reduction in Vietnam since implementing Doi Moi in 1986, qualitative and quantitative evidence indicates that these achievements are not distributed equitably among all ethnic groups (Van de Walle

et al., 2001; World Bank, 2012; Tran, 2015; Vu, 2020). EMHs not only consistently earn lower incomes than Kinh households but also face limited opportunities to uplift them from poverty compared to the Kinh (MOLISA, 2015). There are many reasons to explain the slow development of EMH in Vietnam. EMHs have less access to land, education, and credit and are less efficient in using resources (World Bank, 2012). In terms of income sources, it shows that EMHs have more income diversification or off-farm, which often are dependent on common resources, while Kinh households are mainly engaged in paid work or self-employment. These existing studies have not discovered the relationship between credit and productive land with the incomes of EMHs (MOLISA, 2015; Tran, 2015).

Nguyen *et al.* (2019) revealed several factors influencing the poverty of disadvantaged households, including inadequate production capital, insufficient means of production, poor health and limited labor opportunities, large family sizes, a lack of job prospects or unemployment, and a lack of motivation and education to escape poverty. Consequently, they emphasize the necessity of implementing poverty reduction policies for these households in the future. Based on the analysis and regression results, several recommendations are proposed. First, concentrating on implementing preferential loan policies targeted explicitly at impoverished individuals can have a significant positive impact on poverty reduction. Second, by introducing vocational training programs, it is possible to enhance the income-generating capabilities of Khmer ethnic households. Third, developing specialized infrastructure in regions inhabited by the Khmer ethnic group will aid in increasing their income. Fourth, by emphasizing promoting cultural and religious institutions within areas inhabited by the Khmer ethnic community and enhancing and expanding healthcare clinic services and facilities in these regions, the government can eventually reach its goals of poverty fighting.

Tran *et al.* (2021) conducted a study in Son La province, which is among the most impoverished regions in Vietnam, to assess the vulnerability of various smallholder farmers. They utilized the livelihood vulnerability index (LVI) method and qualitative data analysis, surveying 240 households belonging to four minority ethnic groups. The findings highlighted that household vulnerability is influenced by multiple factors, including income diversity, debt levels, organizational membership, local authorities' support and awareness, access to health services and water resources, and geographical location. The results showed that, on average, two of the ethnic groups' households exhibited higher vulnerability, particularly concerning aspects like livelihood strategies, health, access to water, housing, productive land, and social networks, compared to the other two ethnic groups. This study underscores the necessity for targeted interventions to reduce vulnerability within these specific small ethnic communities and others facing similar circumstances.

In Vietnam, ethnic minority communities experience disadvantages, resulting in inferior livelihood outcomes compared to the majority population (World Bank, 2009). These disadvantages include limited education access facilities and productive land (MOLISA, 2015).

Numerous studies consistently establish that household characteristics, such as ethnicity, gender, education of the household head, and household size, significantly impact their incomes (Haughton *et al.*, 1999; Tran, 2015; Vu, 2020). Furthermore, previous research

affirms the positive role of livelihood diversification, mainly through off-farm employment, in augmenting household incomes and reducing poverty. It can be concluded that diversifying livelihood activities assists households in enhancing their economic well-being (Rigg, 2006; MOLISA, 2015; Tran, 2015; Vu, 2020).

In terms of methodology, various scholars have employed different methods based on the nature of their research data to analyze the factors influencing household incomes (Haughton *et al.*, 1999; World Bank, 2009; Nguyen and Nguyen, 2019; Vu, 2020). In this study, we adopt the method used by Haughton *et al.* (1999) and World Bank (2009) to explore the factors impacting the incomes of EMHs in Khanh Vinh district, Khanh Hoa province, Vietnam. The findings from this research hold significant importance for guiding local government policies to improve the well-being of EMHs in the study area.

3. Research method

3.1 Research location

Khanh Vinh district, situated in the westernmost region of Khanh Hoa province, is characterized by its mountainous and semi-mountainous terrain. It is located approximately 32.4 km away from Nha Trang City, with geographical coordinates of 12°16'53"N and 108°54'27"E. The district shares its borders with Ninh Hoa town and Dak Lak Province to the North, Lam Dong Province to the West, Khanh Son District and Ninh Thuan Province to the South, and Dien Khanh District to the East.

The district covers an area of 1,165 km² and has a population of 37,648. Among them, the Raglai people constitute the largest ethnic group, with 17,464 individuals, accounting for 48.5% of the population. The Kinh people have around 9,512 individuals, representing 26.4% of the population. The Muong people (T'Ring) comprise about 5,078 individuals, making up 14.01% of the population. Additionally, there are 1,655 Ede people, accounting for 4.6%; 1,286 Tay people, making up 3.6%; 720 Nung people, and 209 Muong people, along with other smaller ethnic groups.

Khanh Vinh district is divided into 14 administrative units at the commune level. These include Khanh Vinh town, which serves as the district capital, and 13 communes, which are Cau Ba, Giang Ly, Khanh Binh, Khanh Dong, Khanh Hiep, Khanh Nam, Khanh Phu, Khanh Thanh, Khanh Thuong, Khanh Trung, Lien Sang, Son Thai, and Song Cau.

Khanh Vinh district possesses the distinct traits of a mountainous region, with approximately 90% of its natural area covered by forests. The livelihood of the population primarily revolves around agriculture and forestry activities. Most residents in Khanh Vinh are ethnic minorities, and within the district, 15 different ethnic groups co-exist harmoniously. Raglai people, except for Giang Ly commune, inhabit most of the communes and towns. Meanwhile, the T'Ring people are concentrated in the southern communes of the district and constitute the majority in Cau Ba, Son Thai, and Giang Ly communes. The Ede people predominantly reside in the northwestern part of the district, close to the border with Dak Lak province.

In recent years, the Tay, Nung, Muong, and other ethnic groups have migrated mainly from the northern regions of Vietnam and settled in the northern communes of Khanh Vinh district. These ethnic minorities have adopted a settled lifestyle and engaged in relatively stable wet-rice production practices. Additionally, they have been focusing on cultivating sugarcane and establishing a concentrated material crop area following the provincial plan.

3.2 Research methods

Study sample and sampling method

According to Yamane (1967), the following formula is applied to collect the desired sample size for the whole survey:

$$n = \frac{N}{1 + N(e)^2}$$

where n is the sample size, N is the population size, and e is the desired level of expectation (variation level of 0.05 or confidence level of 95%). Therefore, the study investigated 150 EMHs in Khanh Vinh district, and this sample size is appropriate.

Sampling method

The study uses systematic random sampling to collect data. The sample size is proportional to the number of households in each locality (commune). The household survey was conducted between September and December 2020.

Econometric models and analytical methods

In this study, we use the multivariate regression analysis method to identify factors and their influence on the incomes of EMHs in mountainous areas of Khanh Hoa province.

According to Haughton *et al.* (1999), World Bank (2009) econometric model analyzes the factors affecting household incomes in the form of a semi-logarithmic function as follows:

$$\ln(Y_i) = \beta_0 + \beta_i X_i + \varepsilon$$

where Y_i is the dependent variable, showing the household's incomes in the year; β_0, β_i are regression coefficients of the model; X_i is the independent variable, with $i=1, 2, \dots, 9$; ε is the error of the model.

Table 1. Measurement of variables in the research model

Variable symbol	Variable name	Description of variables	Expectations (sign)
Y	Household incomes for the year	Dependent variable	
X1	Ethnic group	As a dummy variable, taking value 1 if the household is ethnic Raglay; equals 0 if households of other ethnicities.	-

Table 1. Measurement of variables in the research model (*continued*)

Variable symbol	Variable name	Description of variables	Expectations (sign)
X2	Sex	As a dummy variable, taking the value 1 if the head of household is male; equals 0 if the households are female.	+
X3	Age of household head	The age of the household head is determined from the year of birth to the time of the survey (year).	+
X4	Schooling	As a dummy variable, taking the value of 1 if the household head has a lower secondary education level or higher; equals 0 if the head of the household has a primary education level or less.	+
X5	Size of household	Number of family members (person).	+
X6	Number of livelihood activities	The variable represents the number of livelihood activities - income-generating activities of the household during the year (operation number).	+
X7	Idle time of the year	Leisure time and no job in the year (month).	-
X8	Access to productive land	It is a variable reflecting the household's productive land area in m ² .	+
X9	Access to credit	It is a variable reflecting the amount of money that households borrow from local credit institutions in millions of Vietnamese Dong (VND).	+

Source: Authors' compilation

4. Research results and discussion

4.1 Characteristics of the survey sample

The study investigated 150 EMHs (except for the Kinh ethnic group, which is common in Vietnam) in the Khanh Son district. However, due to insufficient information on some questionnaires, the final number of eligible responses for analysis amounted to 139, representing 92.67% of the total. Among the surveyed households, the Raglai ethnic group constituted 68%, followed by T'Ring ethnic households at 21%. The Ede ethnic group accounted for 0.6%, while the Tay ethnic group comprised 0.5% of the participants.

In the survey sample, there are 73 female heads of households, accounting for 52.5%; 66 heads of households are male, accounting for 47.55%. The lowest age of household heads is 18, while the highest is 75. The average age of the household head in the sample is 57.78 years old. The smallest household size is 2 and the largest is 13, the average household size is 5. The smallest number of dependents is 0 and the largest is 6. The education level of the household head is relatively low. In general, the percentage of household heads who do not attend school at all and attend primary school or below is relatively high, at 48.2%; those with lower secondary school and above accounted for 51.8%.

Table 2. The education level of the household head in the sample

	Frequency	Percent	Valid percent	Cumulative percent
No schooling	4	2.9	2.9	2.9
Primary level	63	45.3	45.3	48.2
Lower Secondary	49	35.3	35.3	83.5
Upper Secondary	23	16.5	16.5	100.0
Total	139	100.0	100.0	

Source: Authors' calculation

4.2 Characteristics of livelihood activities and incomes of ethnic minority households

Most households have diversified livelihood activities. The smallest number of household livelihood activities is 1 and the largest is 5. On average, each household has three livelihood activities. However, the livelihood activities of households are mainly small-scale agricultural (cultivation, livestock) activities, forestry (e.g., afforestation and forest-related activities), small business, trading, sale, and other activities (staff, employees). Their jobs are unstable and often create a lot of idle time without income for the household. The analysis results show that the average idle time in the household is 0.5 months at the lowest and 4 months at the highest. On average, each household in the year has a period of no income generating of 2.12 months.

Among the 139 surveyed households, 130 engaged in farming, accounting for the highest percentage with 25.3%; 116 hired labor (mainly peeling acacia skin), accounting for 29.1% of households in the sample. Economic activities, such as rice cultivation, afforestation, animal husbandry, and trading, are insignificant.

Table 3. Livelihood activities of poor ethnic minority households in Khanh Vinh district, Khanh Hoa province

Livelihood activities	Responses		Percent of cases
	N	Percent	
Agriculture (Rice cultivation, farming, animal husbandry)	136	28.8	97.8
Forestry (forest planting, tree care)	131	27.8	94.2
Business, small trades	82	17.4	59.0
Other activities (employees, workers, hired workers)	123	26.1	88.5
Total	472	100.0	339.6

Source: Authors' calculation

Statistical results show that the smallest household income from agricultural activities is 2.700 million VND, the largest is 121.500 million VND, and the average is 28.661 million VND. Meanwhile, the minimum income from forestry activities is 1.980 million VND, the largest is 90.000 million VND, and the average is 25.277 million VND.

Table 4. Descriptive statistics of income sources from livelihood

	N	Minimum	Maximum	Mean	Std. deviation
Income from agriculture	136	2.700	12.150	28.661	18.153
Income from forestry	73	1.980	90.000	15.277	14.761
Income from business, trading	20	3.600	47.700	16.839	13.188
Income from other activities	80	2.340	46.800	18.627	10.666

Source: Authors' calculation

Consequently, most households' primary income source is agricultural livelihood activities, with additional earnings coming from occupations like employment, labor, and hired work. The income generated from forestry-based livelihoods comes next in line. On the other hand, the income contribution from business and trade activities remains relatively minor compared to the overall household income.

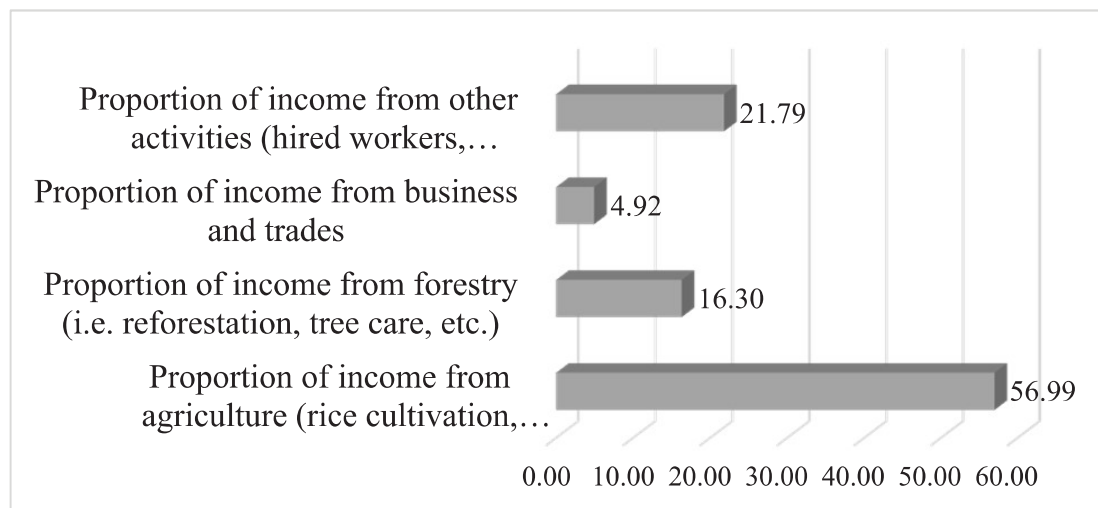


Figure 1. Structure of incomes from livelihood activities of ethnic households

Source: Authors' calculation

4.3 Determinants of the income of ethnic minority households

This study estimated the model by using the ordinary least squares method. The hypothesis tests satisfy the following requirements: linearity and additivity of the relationship between dependent and independent variables, statistical independence of the errors, homoscedasticity of the errors, and normality of the error distribution. The results of the regression model fit tests are guaranteed and meet the requirements. The model estimation results show that the regression coefficients of the variables all have signs as expected. Five main factors have been identified among the factors influencing incomes from livelihood activities of EMHs in Khanh Vinh district. The number of livelihood activities the household pursues exerts the most significant impact on their incomes, followed by the area of productive land, which holds the second most substantial influence. Household size ranks as the third most influential

factor, while other factors fall subsequently in terms of their effects on household incomes. Lastly, the leisure time available to the household throughout the year has the smallest effect on their overall income.

Table 5. Model estimation results

Variable	Symbol	Unstandardized coefficients		Standardized coefficients	T	Sig.
		B	Std. Error	Beta		
Block coefficient	(Constant)	5.977	0.939		6.365	0.000
Ethnicity	X1	-0.308	0.097	-0.287	-3.191	0.002
Sex	X2	0.055	0.076	0.064	0.724	0.471
Age of household head	X3	-0.141	0.132	-0.117	-1.067	0.290
Schooling	X4	0.004	0.078	0.005	0.057	0.955
Size of household	X5	0.348	0.125	0.298	2.786	0.007
Number of livelihood activities	X6	0.746	0.250	0.283	2.980	0.004
Idle time of the year	X7	-0.061	0.030	-0.192	-2.063	0.043
Access to productive land	X8	0.385	0.096	0.406	4.014	0.000
Access to credit	X9	0.144	0.092	0.143	1.566	0.122
F (Sig.)			8.306 (0.000)			
R-squared (Adjusted R-squared)			0.503 (0.442)			

Source: Authors' calculation

The ethnicity variable has a negative sign and is statistically significant at a 1% significance level. Thus, households of Raglay ethnicity earned less than households of other ethnicities in that year. Many Raglayan households, despite working hard, are oblivious to why this was the case. The results can be explained through local practices and are similar to those of previous studies by World Bank (2012), MOLISA (2015), Vu (2020), Pham *et al.* (2020). Furthermore, households with male household heads earn more from livelihood activities, while households with female heads earn less. The leaders of the former type of households often decide on major issues such as income diversification. However, the relationship between gender and household income has not been identified.

The regression coefficient of the age of household heads variable is negative, which does not meet expectations. However, this coefficient is not statistically significant. This implies that no relationship exists between the age of the household heads and the household income. This finding is consistent with Vu (2020).

The education factor in the regression model has the expected sign. This shows that the heads of EMHs with higher education will have conditions to access new knowledge and livelihood methods, which will positively affect the income generation of households. However, this study did not find a correlation between education level and household income.

The regression coefficient of the schooling variable is not statistically significant. This finding is consistent with that of Pham *et al.* (2020). The household size factor in the regression model has a positive effect on household incomes, which implies that if a household has one more member of working age, it can increase the household's income. However, adding more members will reduce per capita incomes. This finding is consistent with Haughton *et al.* (1999), Tuyen (2015), and Vu (2020).

Idle time in the year in the regression model has a negative sign, matching the researchers' expectation, and is statistically significant at 5%. This implies that EMHs with a lot of leisure time during the year will have fewer conditions to participate in income-generating livelihood activities. This is the new finding of the study. The income-generating livelihood activities reflect the livelihood diversity factor count, which bears a positive sign in the regression result and is statistically significant at 5%. Ethnic households are more open to opportunities to improve their income if they diversify their income. In general, this finding is also consistent with the results of the World Bank (2009), Tuyen (2015), MOLISA (2015), Ho and Pham (2020).

The variable related to access to productive land also exhibits a positive regression coefficient, as initially predicted, and it holds statistical significance at the 1% level. Consequently, the empirical evidence from this study indicates that households with access to land possess the necessary conditions to organize production, which leads to an increase in the income. This finding corresponds with previous studies conducted by the World Bank (2009), MOLISA (2015), Ho and Pham (2020).

Furthermore, the factor of credit access exhibits a positive regression coefficient, as anticipated. This implies that when households have access to credit, they gain numerous opportunities to invest in and expand their livelihood activities, ultimately leading to improved incomes. However, despite the expected positive impact, the study did not find concrete evidence of a direct relationship between credit access and household incomes. This finding aligns with Tran (2015).

5. Conclusion

In this research, the impact of various factors on the incomes of EMHs in Khanh Vinh district, Khanh Hoa province (Vietnam), was thoroughly analyzed. The results of the tests have demonstrated that ethnic characteristics, household size, the number of livelihood activities pursued, leisure time in the year, and household access to productive land significantly influence the income levels of EMHs. Based on these research findings, several policy recommendations are proposed for local authorities to enhance income levels through diversifying livelihood activities for ethnic households in this region.

First, the local government should implement a policy for equitable allocation of land resources in the area, with special attention given to reviewing arable land, the production of forest land, and other relevant resources. This allocation strategy aims to provide productive land to households that currently lack access to it, particularly Raglai ethnic households and

larger-scale households. It is also necessary to have a policy to discourage the sale or transfer of productive land to ensure that EMH always has land for cultivation.

Second, there is a need to enhance local agro-forestry extension efforts, providing ethnic minority households with access to modern knowledge and techniques in agricultural activities. This transformation aims to move away from traditional farming practices, such as clearing fields for farming. Moreover, it is essential to diversify the structure of crops and livestock, focusing on higher value per unit area. Additionally, building communal villages and groups of ethnic minority households will foster improved economic conditions and facilitate the exchange of experiences related to successful production models. This knowledge-sharing will act as a driving force for other households to progress and develop together effectively.

Third, it is crucial to prioritize education and vocational training for young households, ensuring they can access modern science, technology, and new knowledge. The current situation indicates that households with limited education face difficulties accessing the benefits of science and technology, leading to lower productivity levels. Therefore, by promoting education and vocational training, these young households can equip themselves with the necessary skills and knowledge to enhance their productivity and overall well-being.

Fourth, policies are necessary to create jobs and encourage off-farm livelihood activities. The research results show that the number of free months in the year for EMHs is quite large, and there are few income-generating activities during this period. Therefore, the policy of supporting off-farm employment for EMHs through the activities of local socio-political organizations, such as farmers' unions, women's unions, and youth unions. It is also necessary to identify the professions and labor areas that ethnic households can access and demand for both ends to meet.

References

- Haughton, D., Haughton, J., Bales, S., Chuyen, T.T.K. and Nga, N.N. (1999), *Health and wealth in Vietnam: an analysis of household living standards*, Institute of Southeast Asian Studies, Singapore.
- Haughton, J. and Khandker, S.R. (2009), *Handbook on poverty and inequality*, World Bank Publications.
- Ho, V.M. and Pham, H.M. (2019), "Impact of poverty reduction policy for ethnic minority households in mountainous areas of Khanh Hoa province", *Journal of Economic Studies*, Vol. 5 No. 492, pp. 85 - 96.
- Hoang, V.C. and Nguyen, T.H.Y. (2020), "A quantitative analysis of housing and its correlates in rural Vietnam", *Management Science Letters*, Vol. 10 No. 11, pp. 2419 - 2424.
- Khanh Vinh District People's Committee. (2021), *Administrative map of Khanh Vinh district*, Khanh Hoa, Vietnam.
- MOLISA. (2015), *Multidimensional poverty in Vietnam: reducing poverty in all its dimensions to ensure a good quality life for all (Summary report)*, UNDP, Vietnam.

- Nguyen, H.H. and Nguyen, N.V. (2019), “Factor affecting poverty and policy implication of poverty reduction: a case study for the Khmer ethnic people in Tra Vinh province, Viet Nam”, *The Journal of Asian Finance, Economics and Business*, Vol. 6 No. 1, pp. 315 - 319.
- Nguyen, H.M. and Nguyen, T.A. (2019), “Investigating the determinants of household welfare in the Central Highland, Vietnam”, *Cogent Economics and Finance*, Vol. 7 No. 1, 1684179.
- Pham, H.M., Luu, H.V. and Ho, V.M. (2020), “Analysis of factors affecting income of poor ethnic minority households in mountainous areas in Khanh Hoa province”, *Journal of Economic Studies*, Vol. 4 No. 503, pp. 73 - 79.
- Rigg, J. (2006), “Land, farming, livelihoods, and poverty: rethinking the links in the rural South”, *World Development*, Vol. 34 No. 1, pp. 180 - 202.
- Tran, T.Q. (2015), “Socio-economic determinants of household income among ethnic minorities in the North-West mountains, Vietnam”, *Croatian Economic Survey*, Vol. 17 No. 1, pp. 139 - 159.
- Tran, V.T., An Vo, D.A, Cockfield, G. and Mushtaq, S. (2021), “Assessing livelihood vulnerability of minority ethnic groups to climate change: a case study from the Northwest mountainous regions of Vietnam”, *Sustainability*, Vol. 13 No. 13, 7106.
- Van de Walle, D. and Gunewardena, D. (2001), “Sources of ethnic inequality in Vietnam”, *Journal of Development Economics*, Vol. 65 No. 1, pp. 177 - 207.
- Vu, V.H. (2020), “The impact of education on household income in rural Vietnam”, *International Journal of Financial Studies*, Vol. 8 No. 1, 11.
- World Bank. (2009), *Handbook on poverty and inequality*, World Bank, Washington, D.C.
- World Bank. (2012), “Well begun, not yet done: Vietnam’s remarkable progress on poverty reduction and the emerging challenges”, *2012 Vietnam Poverty Assessment Report*, Hanoi.
- Yamane, T. (1967), *Statistics: an introductory analysis*, 2nd Edition, Harper and Row, New York.