

THE IMPACT OF POVERTY ALLEVIATION PROGRAM ON THE ABILITY OF ESCAPING FROM POVERTY OF ETHNIC MINORITY HOUSEHOLD IN BAC AI DISTRICT, NINH THUAN PROVINCE

Nam H. Tran¹, Hoang M. Do¹

Nong Lam University, Ho Chi Minh City, Vietnam

Email: hoainam@hcmuaf.edu.vn

Abstract: The study used a multinomial logit regression model with MLE estimating method to evaluate the impact of poverty alleviation programs on the ability of escaping from poverty of ethnic minority households. A sample of 260 ethnic households in Bac Ai district, Ninh Thuan province were employed in this study. The results show that the probability of a poor and pro-poor ethnic minority household escaping from poverty is 8.1% and 12.35%, respectively. In addition, factors affecting the ability of escaping from poverty are household head age, education level, labor rate, agricultural land area, the occupation of the household head and supporting policy. Another finding is while supporting policy has positively affected pro-poor households, it has negatively affected poor households.

Keywords: Poverty, poverty alleviation, multinomial logit model.

1. INTRODUCTION

Viet Nam has enacted and implemented a comprehensive policy system for poverty reduction. Poverty reduction is a great policy that has been consistently implemented by the Party and State for many years. The poverty reduction achieved during the past time is very impressive, the poverty rate has decreased from 22% in 2005 to 9.45% in 2010 (old standard) and from 14.2% in 2010 to 9.6% in 2012 (Government, 2014). However, there are many concerns related to the living standards of the poor and pro-poor households, which are not significantly different; so the risk of re-poverty is high and the gap between the rich and the poor increases substantially (from 8.1 to 9.4% in 2012), the poverty rate in ethnic minority, remote and mountainous areas remains high; and ethnic minorities make up nearly 50% of the national poor population (Thu D.M, 2017). This may be due to the lack of synchronous and long-term policies, lack of close linkage, lack of suitable of management mechanism, operating command as well as the implementation of poverty reduction targets in some areas is not yet deep (Government, 2014).

In addition, the ethnic minority community participating in poverty reduction programs mainly stops in the role of "beneficiaries" but not actively jump out of poverty (Tho T.L, 2013). Therefore, the poverty reduction program in Vietnam will be increasingly difficult and defined as a focus of development policy (Cuong N.V et al, 2010; Tu T.T et al., 2015). This study was conducted with the objective of evaluating the impact of the poverty reduction program on the

poverty escape ability of people living in Bac Ai district, Ninh Thuan province; and suggesting some solutions related to reduction policy for ethnic minorities.

2. CONCEPTUAL FRAMEWORK

Poverty reduction support is the process of using policy mechanisms, government resources, and socio-economic organizations at home and abroad to support the process of poverty reduction through the implementation of mechanisms policy, public investment solutions. The focus of public support and public investment in poverty reduction in each country is focused on a number of different focus areas: the focus is on public investment in priority education, irrigation, energy and transport. India focuses on education, irrigation, rural development, energy, and transport. Thailand concentrates its resources primarily on education, and transportation (Chung D.K, 2010). The Vietnamese government has been allocating many resources in supporting and increasing public investment for poverty reduction (2011-2020) that is more effective the poverty reduction policy, diversify resources and modalities to ensure sustainable poverty reduction (the National Target Program for Poverty Reduction 2011-2020). Research by Son N. N (2012) shows that the three most effective policies for reducing poverty and improving the quality of life for low-income people in Vietnam are the reduction of medical costs, exemption from tuition fees and preferential credit for the poor. Meanwhile, Duy V.Q (2012) believes that receiving credit support improves the lives of children as it provides higher levels of health and education spending for low-income households. In contrast, Nu P.T (2010), when assessing credit support policy for the poor in rural Vietnam has identified credit an increase in expenditure for poor households but has no impact on income growth and the best way to escape poverty is to invest in education. Tu T.T.T (2015); Huong N.T.X (2018) that in the short term, formal credit access has no impact on living standards except for education.

3. STUDY AREA

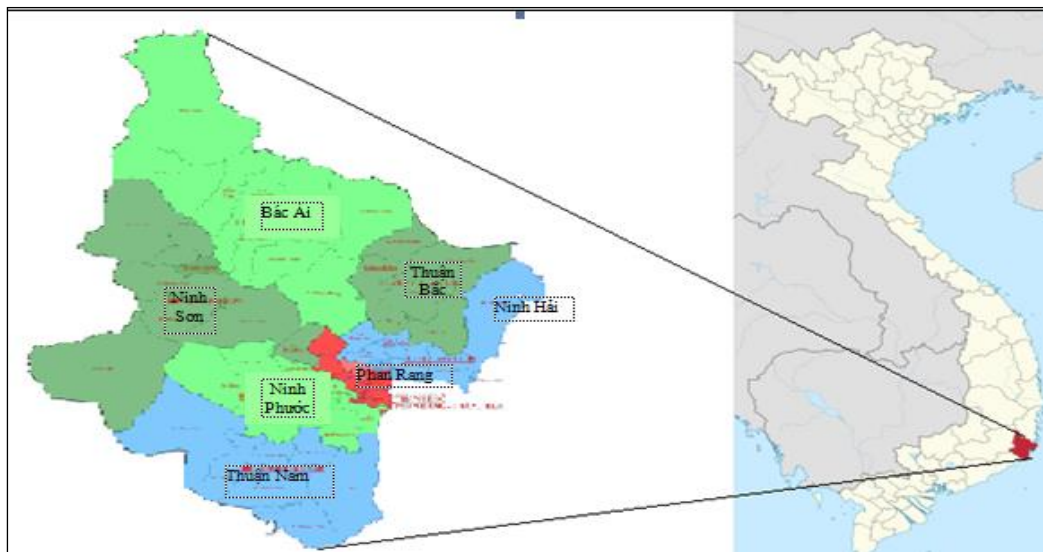


Figure 1: Study area

Ninh Thuan Province is located in central Viet Nam, bordered on the east by the South China Sea, on the west by Lam Dong province, on the north by Khanh Hoa province and on the south by Binh Thuan Province. The province has an area of 3,358 km² and is divided into seven administrative districts. The estimated population is 590,377 in 2014 with about 213,716 (36.20%) urban residents and 376,660 (63.80%) rural residents.

4. MATERIALS AND METHODS

4.1 Data sources

The sample of this study was selected by interviewing 260 households in the Bac Ai district. Poverty is widespread in the ethnic minority group (Bac Ai is 46.37% ethnic minority households that highest Ninh Thuan province) and the poverty reduction policies were implemented at Bac Ai district.

4.2 Methodology

The Multinomial Logit (MNL) model is one of the most important models for multi categorical responses. This model is used to make predictions about and explain relationships among variables in a wide variety of areas, including business, economics, education, healthcare, and geography. As it is an enhanced version of logistic regression, multinomial logistic regression shares the problem associated with logistic regression but with more complications involved (Pannapa, 2013).

The MNL model is expressed as follows:

$$\text{Log} \left(\frac{P_{ij}}{P_{i1}} \right) = x_i \beta_j \text{ for } j = 1, \dots, j, i=1, \dots, N$$

Where, P_{ij} is $\text{Prob}(Y=j/x)$, which is obtained as follows:

$$p(y = j / x_i) = \frac{\exp(x_i \beta_j)}{1 + \sum_{j=1}^j \exp(x_i \beta_j)}$$

We can be estimated by the method of maximum likelihood. In this model, the probability is obtained as follows:

$$p(Y = 1) = \frac{1}{1 + \sum_{j=1}^j \exp(x_i \beta_j)}$$

$$p(Y = j) = \frac{\exp(x_i \beta_j)}{1 + \sum_{j=1}^j \exp(x_i \beta_j)}$$

The benefit of using multinomial logit model is that it models the odds of each category relative to a baseline category as a function of covariates, and it can test the equality of coefficients even if confounders are different (M. R. Kohansal, 2013).

In this study, the Multinomial Logit (MNL) model is used to analyze the impact of poverty alleviation program on the ability of escaping from poverty of ethnic minority household in Bac Ai district, Ninh Thuan province. Variables were defined in the table 1.

Table 1: Variables used in the multinomial logit model and their expected signs

Variables	Definition and measurement	Expected sign
Y	0: Non – poor households (base outcome) 1: Pro-poor households 2: Poor households	
X ₁	Age of the household head (years)	+
X ₂	Education of the household head (years)	-
X ₃	Rate of labor (number of employees / total household members)	-
X ₄	Farm-scale (1000m ²)	-
D ₁	Gender of the household head (Dummy variable with value 1: male; 0: female)	-
D ₂	Occupation of the household head (Dummy variable with value 1: farmer; 0: off-farmer)	+
D ₃	Poverty alleviation program (Dummy variable with value 1: supportive policy; 0: no supportive policy)	+

Marginal probabilities of choice (marginal effects) can be calculated from the equation below:

$$\frac{\partial P_j}{\partial X_k} = P_j (\beta_{jk} - \sum_{j=1}^j P_j \beta_{jk})$$

We can find changes in probabilities for primary choice in adaptability farmers, while holding all other explanatory variables fixed. The empirical specification for examining the influence of explanatory variable which are described in table 1 on the choice of Y is gives as follows:

$$Y_{i=1,2...j} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 D_1 + \beta_6 D_2 + \beta_7 D_3 + \varepsilon$$

5. RESULTS AND DISCUSSION

5.1 Income status of the ethnic minority households

The statistical results from Table 2 show that the respondents are diverse in age and educational level. The average age of the household head is about 41 years old, of which age from 30 to 50 accounts for the highest proportion of 59.8% (non-poor households), 58.06% (pro-poor households) and 50.05% (poor households); at this age, the farmers still have enough health to directly participate in the production. On the other hand, the educational level of the household head has a clear distinction, most of the non-poor households have a lower secondary education level (82.35%). Pro-poor and poor households are the mostly high school which the poor are illiterate still accounts 39.58%. In addition, poorest households have a total land area less than 5,000 square meters (78.13%) and it is one of the reasons for their low and unstable income.

Table 2. General information about the interviewees

Category	Non-poor		Pro-poor		Poor	
	N	ratio(%)	N	ratio(%)	N	ratio(%)
1. Gender						
Male	13	12,75	7	11,29	12	12,50
Female	89	87,25	55	88,71	84	87,50
2. Age						
<= 30	12	11,76	9	14,52	1	1,04
30 – 40	29	28,43	21	33,87	21	21,88
40 – 50	32	31,37	15	24,19	28	29,17
50 – 60	24	23,53	11	17,74	38	39,58
>= 60	5	4,90	7	11,29	8	8,33
3. Education						
Illiterate	6	5,88	16	25,81	38	39,58
Primary	12	11,76	19	30,65	32	33,34
Secondary	35	34,31	27	43,55	26	27,08
High school	40	39,22	0	0,00	0	0,00
College	9	8,82	0	0,00	0	0,00
4. Production size						
<=1.000m ²	16	15,69	23	37,10	36	37,50
1.000m ² –5.000m ²	29	28,43	13	20,97	39	40,63
5.000m ² –10.000m ²	27	26,47	26	41,94	21	21,88
>= 10.000 m ²	30	29,41	0	0,00	0	0,00

Source: Survey data, 2018

In addition, gender of the household head is one of the factors that influence the decision in production. Based on the statistical results, more than 85% of the sex of the household head is female (matrilineal ethnicity), although women have a more decisive voice in the family but affect the assignment of work in the family.

Table 3: Average income of people per household per year in 2018

Unit: 1000 VND

Income source	Non-poor		Pro-poor		Poor	
	Total	Ratio (%)	Total	Ratio (%)	Total	Ratio (%)
Average	18.585		11.089		7.651	
Agriculture	12.458	67,03	7.125	64,25	4.216	55,10
Farming	9.872	79,24	5.365	75,30	2.584	61,29
Livestock	2.586	20,76	1.760	24,70	1.632	38,71
Non - Agriculture	6.127	32,97	3.964	35,75	3.435	44,90
Wage	2.406	39,27	430	10,85	0	0,00
Hired labour	3.491	56,98	2.783	70,21	1.620	47,16
Forest	0	0,00	541	13,65	764	22,24
Subsidy	0	0,00	210	5,30	1.051	30,60

Source: Survey data, 2018

In general, the average income of the non-poor is 18.585 million VND per year, which is 1.68 times higher than the average income of pro - poor households and 2.43 times of poor households. The income generating ability of households from agriculture still accounts for a large share of total household income. Table 2 shows the production activities of households in cultivation, livestock and other off-farm activities. However, there were 36.93% of poor households in total 260 households surveyed and 13.73% of their total income was from subsidies. This suggests that poor households are highly dependent on income from subsidies.

5.2 Evaluating the impact of the poverty reduction program on the poverty escape ability of the ethnic minority households

5.2.1 Household perception of the poverty causes

Poor households often lack resources and they fall into the vicious circle of poverty. Poor households are likely to remain poor because they can not invest in their human resources and low human capital impedes them from getting out of poverty. This situation is also one of the factors explaining the cause of ethnic minorities living in difficult areas. Table 3 shows the causes of poverty in the local, including: low income, lack of employment, low education, no assets, lots of children and no way of doing business.

Table 4: Awareness of the causes of poverty

Reason	Poor		Non-poor (including pro-poor)	
	N	Ratio (%)	N	Ratio (%)
Low income	90	93,75	151	92,07
Lack of employment	85	88,54	135	82,32
Encouragement not working of poverty reduction policy	28	29,17	44	26,83
Alcoholism and smoking habit	37	38,54	78	47,56
Low education	82	85,42	135	82,32
No way of doing business	58	60,04	91	55,49
Lots of children	63	65,6	113	68,90
No assets	73	76,0	115	70,12

Source: Survey data, 2018

5.2.2 The regression model impacts from the poverty reduction program on the ability to escape poverty of ethnic minority households

The regression results in the multinomial logit model are shown in Table 5. The R² coefficient of the model is 27.83%, which indicates the suitability of the multinomial logit model and the independent variables in the model explained the possibility of escaping poverty among ethnic minority households. The results show that the probability of a poor and pro-poor ethnic minority household escaping from poverty is 8.1% and 12.35%.

Table 5: Estimation results of multinomial logistic regression model

Interpretation	Y=1		Y=2	
	Coefficient	P-value	Coefficient	P-value
C	1,711		0,946	
X ₁ (Age)	-0,017 ^{ns}	0,353	-0,023 ^{ns}	0,568
X ₂ (Educational level)	0,001*	0,064	0,103**	0,038
X ₃ (Labor rate)	0,028***	0,000	-0,002 ^{ns}	0,942
X ₄ (Agricultural land area)	1,922**	0,023	0,513*	0,052
D ₁ (Gender)	0,155 ^{ns}	0,376	-0,261 ^{ns}	0,414
D ₂ (Occupation)	- 2,614***	0,000	-1,966*	0,039
D ₃ (Supportive policy)	0,201*	0,073	-1,293**	0,013
N	260			
Pseudo R-Square	0,2783			
Model fitting information				
Likelihood ration test	Chi-square=158,64 DF= 14 sig< 0,00000			

Source: Output of Limdep 9 Software

Note: ***, **, * mean of 1%, 5% and 10% respectively; ns is not statistically significant.

The regression results from Table 5 showed that variables such as the age of household head, educational level, labor rate, agricultural land area, occupation of household head, supportive policy affected the poverty escape ability. Meanwhile, the gender variable was not statistically significant in explaining the household's ability to get away the poverty. It is perfectly appropriateness when sex among household groups was not significantly different.

Table 6: Marginal impact coefficient

	Marginal effect		
	Y=0	Y=1	Y=2
X ₁ (Age)	0,005	-0,004	-0,005
X ₂ (Educational level)	0,014	0,044	0,019
X ₃ (Labor rate)	0,006	0,001	-0,005
X ₄ (Agricultural land area)	0,057	0,025	0,031

D ₁ (Gender)	0,051	0,016	-0,067
D ₂ (Occupation)	0,138	-0,150	-0,011
D ₃ (Supportive policy)	-0,171	0,076	-0,247

Source: Output of Limdep 9 Software

The results presented in Table 6 illustrated the marginal impact of the factors on the relative odds ration of the pro-poor household probability, the poor with the baseline outcomes (non-poor households selected as the base station). The higher the regression coefficient of a factor showed that the greater the marginal impact of that factor on the relative probability of the factor; which means that the greater the effect on the household's ability to escape poverty. In this model, the pro-poor household probability of getting out of poverty to 4.4% and 1.9% (poor households) when the household educational level increased one year; and the probability of getting away the poverty was 2.5% (pro-poor households) and 3.1% (poor households) when the scale of production increased one ha; Similarly, if the occupation of household head is agriculture, the probability of escaping from poverty will be reduced by 1.5% (pro-poor households) and 1.1% (poor households). To agricultural production labor, the most vital difficulties were input and output price in the unstable production together with the unfavorable weather in recent years affected the income of the households. However, the poverty reduction policy variable in the model had a positive impact on the pro-poor households but a negative impact on poor households, which means that the poverty reduction policy has helped the pro-poor households escaped the poverty but the poor households did not want to escape from poverty, the reason was that some poor households has had the idea of dependency, reliability on the state policy of the poor households was ingrained in the subconscious because the policy approach in the early days of direct support by more money and artifacts than creating opportunities and conditions for the poor people to improve their poverty escapes capacity (Son N.N, 2012).

Table 7 showed the predicted results in the model, with the correct prediction of 65.38%. This means that the regression coefficients in the model were appropriate for explaining the poverty escape probability of ethnic minority households.

Table 7: Predictable result of the model

Indicator	Household	Prediction of model		
		Y =0	Y=1	Y=2
Y =0	102	51	15	36
Y=1	62	2	57	3
Y=2	96	19	15	62
% correct prediction		65,38%		

Source: Output of Limdep 9 Software

5.3 Proposing some solutions to improve the ability of the ethnic minority households to escape poverty.

In order to achieve sustainable poverty reduction, finding appropriate solutions for the poor ethnic minority people in Bac Ai district is very important and necessary. It is necessary to change awareness and improve the capacity of poor households so that they can participate in new opportunities. As the poverty reduction program creates the necessary resources and increased personal capacity, it will enable them to become more aware of their sustainable poverty escape. On the other hand, due to many disadvantages in the characteristics of the household, it is necessary to concentrate on reducing the risk of transmitting poverty from generation to generation. This can be done by increasing the investment in education for children in poor households.

To improve the use efficiency of resources of ethnic minority households, the policies need to help poor households have better access to social services, infrastructure, and employment. At the same time, minimizing language barriers to avoid stereotypes about the capacity of ethnic minority groups; so the government needs to create opportunities and empower these groups to do this.

6. CONCLUSION

The poor households being ethnic minority have low educational level, crowded children, limited resources and mainly agricultural production so they fall into the vicious cycle of poverty. Their income level is almost sufficient to meet the minimum nutritional needs and therefore they do not have the capacity to raise their educational level in the future to escape poverty. The study used the Multinomial Logistic regression by Maximum Likelihood Estimation method to estimate the impact of the poverty reduction program on the ability to get away poverty of the ethnic minority households in Bac Ai district. The results show that the probability of a poor and pro-poor ethnic minority household escaping from poverty is 8.1% and 12.35%, respectively. In addition, the results of the analysis show the factors such as age of household head, educational level, labor rate, agricultural land area, occupation of household head and supportive policy affect the poverty escape probability, in which the supportive policy has a positive impact on the pro-poor households but affects the poor households negatively.

REFERENCES

- [1] Chung K.Do. (2010). *Some Theoretical and Practical Issues on Supporting and Public Investment for Poverty Reduction*, J. Sci. & Devel, 8(4), 708-718.
- [2] Thu M.Do, and Dang V.Nguyen. (2017). *Theoretical and Practical Issues on Enhancing Capability to Implement Poverty Reduction Policies*. Vietnam J.Agr. Sci, Vol. 15, No. 11:1584-1592.
- [3] Government. (2014). *Decree No. 80/NQ-CP of May 19, 2011, On sustainable poverty reduction during 2011-2020*.
- [4] Tho T.Luu, and Duong B.Pham. (2013). *The Participation of Ethnic Communities in Poverty Reduction Activities in the Northern Mountainous Region*. J. Sci. & Devel., Vol. 11, No. 2: 249-259.
- [5] M. R. Kohansal, and A. Firoozzare. (2013). *Applying multinomial logit model for determining socio-economic factors affecting major choice of consumers in food purchasing: the case of Mashhad*. J. Agr. Sci. Tech, 15, 1307-1317.
- [6] Cuong V.Nguyen, Truong N.Tran, and Roy van der Weide. (2010). *Poverty and Inequality Maps in Rural Vietnam: An Application of Small Area Estimation*. Asian Economic Journal, 24(4), 355–390.
- [7] Son N.Nguyen. (2012). *Poverty Reduction policies in Vietnam: Current Status and Orientation for Improvement*. J. Eco. & Devel., 4, 19-26.
- [8] Huong T.X.Nguyen, and Lieu T.B.Duong. (2018). *Factor influencing the use efficiency of VBSP's credit for the poor in O Mon district, Can Tho city*. Journal of forestry science and technology, 3, 39-45.
- [9] Pannapa Changpetch, Dennis K.J. Lin. (2015). *Selection of multinomial logit models via association rules analysis*, Advanced Review, 5, 68-77.
- [10] Phan Thi Nu. (2010). *Assessing the impact of credit on poverty reduction in rural Vietnam*. Thesis, Fulbright, HCM city.
- [11] Tu T.T.Tran, Viet Q.Nguyen, and Loi H.Hoang. (2015). *Determinant of Access to Rural Credit and Its Effect on Living Standard: Case Study about Poor Households in Northwest, Vietnam*, International Journal of Financial Research Vol. 6.
- [12] Duy Q.Vuong. (2012). *Impact of differential access to credit on long and short term livelihood outcomes: group-based and individual microcredit in the Mekong Delta of Vietnam*, CAS Discussion paper No 86, Centre for International Management and Development Antwerp & Centre for ASEAN Studies.