Forest Resource Use and Poverty Alleviation for Forest dependent Communities in the Northern Rural Upland Areas of Vietnam

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Abstract

Viet Nam is a tropical country with the total area is about 33 million hectares, of which 57.6% is classified as forest land. Forest resources are spread across upland areas. This paper examines the relationship between poverty alleviation and the forest sector, the ways that forest resources contributes to poverty alleviation in Northern rural upland areas of Vietnam.

Calculation and regression done with the employment of secondary and primary data show that, there is a mechanical correlation between poverty, fragile soils, accessibility or loss of forest resources that is largely due to association of uplands with high poverty incidence. For the natural resource dependent poor, particularly in mountainous regions, access to and management of forest resources is a major determinant of livelihood security. On the other hand, with commitment to vigorously and sustainably develop forestry, there is the potential for forests to play a significant role in economic development, job creation, income generation and overall poverty alleviation in rural upland areas.

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Findings from the study allow to draw implications for forest and livelihood enhancing development interventions, which emphasize the roles of the Government of Viet Nam and Ministry of Agriculture and Rural Development (MARD). Among the implications, it is importtant that the Government and MARD to adopt a country-wide policy and program on community forest management which should become one of the prime means for forest protection and provision of alternative livelihoods for forest-dependent communities.

Keywords: poverty, poverty alleviation, forest resources, forest - dependents, Northern upland/ moutainous areas, Vietnam.

1. Introduction

The topic of poverty alleviation and forests/ forest resources is growing in importance in Vietnam in general and in Northern mountainous region in particular.

According to FAO (2003) there are three ways in which forests contribute to poverty reduction: (1) by providing the forest resources that are important for maintaining well-being (e.g. medicinal plants, food resources, erosion control); (2) through continued access to forest resources and rents (e.g. access rights, income from forest products); and (3) by increasing forest production values (e.g. payment for environmental services, recreational uses).

Sunderlin and Thu Ba (2005) identifies six modes of forest resource use that can potentially assist the process of poverty alleviation. The first mode is conversion of forests to agriculture: the reduction or removal of forest cover - either on a permanent or temporary basis - frees up land for the establishment and expansion of agriculture and pastoral activities. Moreover, in the same step, it can facilitate access to wood products. The second mode is timber: the annual value of commercial timber in forested developing countries is billions of dollars. The third mode is non-timber forest products (NTFPs), such as: charcoal, fuelwood,

game, fruit, nuts, medicinal herbs, forage, and building materials. The poorest of the poor tend to be those who depend on NTFPs. The fourth mode is environmental services such as restoration of soil fertility in rotational agricultural systems; protection of water quantity and quality; and forage for cattle, pollination, weed control, and maintenance of biodiversity including germplasm for agriculture; indirect environmental services to people living at a distance from forests (carbon storage and sequestration, tourism…) and the poor can benefit from efforts to maintain these services through transfer payments by off-site users to forest dwellers. The fith mode is employment/ job creation for people living in and nearby the forests. And the sixth mode of forest resource use is indirect benefits since forest-based economic activities can lead to livelihood improvements for forest dwellers that would not have otherwise occurred (Local multiplier effects); timber sector development produces revenue for the national treasury and foreign exchange for the country's balance of payments, which in turn might be used for poverty-reducing investments in forest communities (Trickle-down effects).

In light of the indeterminacy of social and environmental consequences in the development process, Jamieson et al. (1998) and MARD (2001) believed forest cover loss underlies deepening poverty in Vietnam, whereas ADB (2000) believed forest depletion is part and parcel of the process of poverty alleviation. William D. Sunderlin (2003) assumed the widest possible array of outcomes, as shown in Figure 1.

Figure 1. Four-fold classification model of human well-being and forest cover
          Source: Sunderlin (2003)

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The Sunderlin's model, applied to the case of forest dwellers and forests, assumes the following definitions: (1) "Win-win" means poverty alleviation and environmental protection are assumed to go hand-in-hand; (2) "Win-lose" means poverty alleviation happen at the expense of forests and biodiversity; (3) "Lose-win" outcomes occur when livelihood security is undermined by excluding local people from forests; and (4) "Lose-lose" outcomes mean that both local people and the environment lose out.

This model is, arguably, a gross over-simplification of what happens in the real world. In reality, there can be a great multiplicity of outcomes in one location. For example, there are often "winners" and "losers" in the same community, and sometimes within the same household.

There is a strongly held belief in much of the literature on environment and development saying that socioeconomic development and environmental conservation, generally speaking, are compatible goals. This assumed lockstep relationship between poverty alleviation and environmental betterment is epitomized by the following quotation from Our Common Future, one of the key documents in the literature on sustainable development: "…poverty is a major cause and effect of environmental problems. It is therefore futile to attempt to deal with environmental problems without a broader perspective that encompasses the factors underlying world poverty and international inequality" (WCED 1987).

Northern upland region includes two sub-regions, East-northern and West-northern, 14 provinces. It is one of 7 broad geographic regions of Vietnam with the area of 95,272.3 square km (28.8% of the country's area), the population is 11,400,200 people in year 2012 (about 13% of Vietnam's population). Being located in the farest north of the country, the region is the home of about 30 ethnic minority groups (among 53 groups in the whole country). The region is also the one which has the most difficult socio-economic conditions with limits on the markets and on labor, especially skilled labor. The region's poverty rate is highest compared to other regions in Vietnam (GSO), (WB 2012).
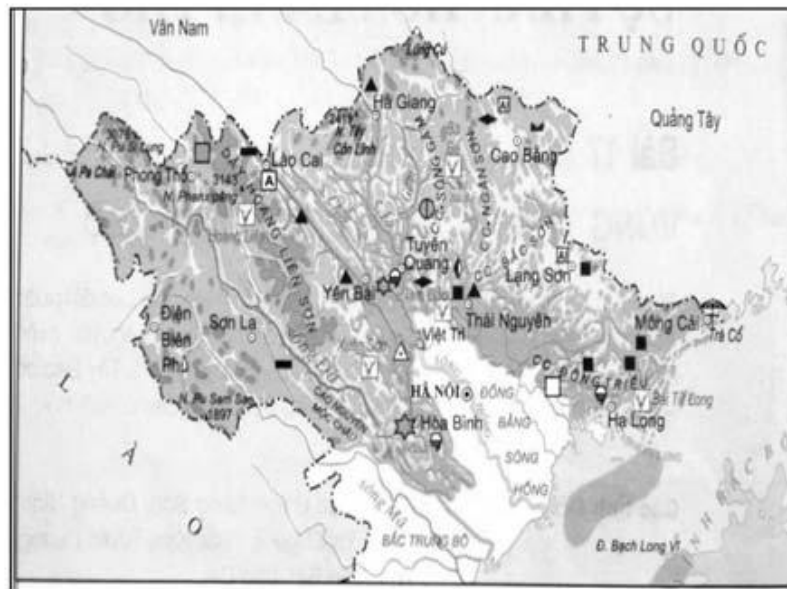
Northern upland region possesses the second highest forest coverage area in Vietnam after the Central Highland region. Forests are important sources of livelihood for the people there as well as important factors in improving environmental quality. However, due to the need of livelihood, forest resources such as timber, non-timber products (fuelwood, fruit, nuts, bamboo shoots, medicinal herbs, forest animals...) have been overly exploited. This process takes place in the long term has led to forest quality of the serious decline. Forest decline, in turn, is the cause of more difficulty in people's lives. Especial case is the northwest corner, near the Chinese border, which is among the poorest in the country yet lacks forest cover. This is an area of relatively recent and rapid deforestation.

This paper examines the relationship between poverty alleviation and the forest sector, the ways that forest resources contributes to poverty alleviation in Northern rural upland areas of Vietnam and proposes recommendations for forest and livelihood enhancing development interventions.

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2. Methodology

The calculation of poverty indicators and forest area changes were done with secondary and primary data. Secondary data was collected from previous studies and available reports of the General Statistical Office (GSO), World Bank (WB), Department of Foresty, Forest Inventory and Planning Institute (FIPI), Ministry of Agriculture and Rural Development (MARD), local authorities. The data includes the overall status of forests, socio- economic situation, the poverty and poverty alleviation in Vietnam as well as in Northern upland region, etc. A small survey was conducted in some communes in Ha Giang province, one of the 14 provinces of the Northern upland region in order to collect primary data and check the socio-economic activities, sources of income as well as the forest depence of the ethnic minority communities there.

Methods of synthesis, comparison, analysis and spatial analysis are employed to analyze/ illustrate the status of poverty, livelihoods and forest area changes as well as their relationships.

Regression and descriptive data analysis: linear regression models performing the relationship between poverty and forest coverage changes were applied, the Microsoft Excel and Eviews softwares were employed.

Regression function representing the relationship between the poverty rate (dependent variable) and changes in forest area and other independent variables has the form as follows:

$$Y = c + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 \quad (1)$$

The functions representing the relationship between changes in forest area and other independent variables, such as poverty rate, household size... are as follows:

$$X1 = a + \alpha_1 Y + \alpha_4 X_4 + \alpha_5 X_5 \quad (2)$$
$$X3 = b + \alpha_2 Y + \alpha_{42} X_4 + \alpha_{52} X_5 \quad (3)$$

Where: Y the poverty rate (%)

  X1 : forest coverage rate (%)

  X2 : Forest fire rate (%)

  X3 : The rate of forest destruction (%)

  X4 : The area of agricultural land per capita (100 m2)

  X5 : household size (people)

  c , $\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$, $\beta 5$ α_{42}, α_{52}: the estimated coefficients

Input data for these models were collected during the period from 1995 to 2008.

3. Results/ Findings

3.1. The Poverty and Poverty Reduction

Poverty can be defined as a pronounced deprivation of well-being related to lack of material income or consumption, low levels of education and health, vulnerability and exposure to risk, no opportunity to be heard and powerlessness (World Bank 2001). Poverty alleviation can therefore be defined as a lessening of the deprivation of well-being.

The poverty rate - defined as the proportion of the population living below the poverty line - is a widely understood and frequently reported measure of poverty. Two different approaches to measure poverty has been used in Vietnam since the early 1990s. The first approach was developed by the Ministry of Labor, Invalids, and Social Affairs (MOLISA). The MOLISA applied the national poverty lines which were initially set at the income equivalent of buying 15 kg, 20 kg and 25 kg of rice per month in mountainous and remote, rural and urban areas respectively. Since 2005 the national poverty lines have been calculated using a Cost- of-Basic-Needs (CBN) methodology similar to the approach led by GSO. The official lines are not adjusted for inflation, but revised in real terms every five years. MOLISA uses this approach to determine budget allocations and define eligibility for a number of targeted poverty reduction programs.

The second approach is led by the General Statistical Office (GSO) which measures poverty and monitors progress on the basis of nationally representative household surveys

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(Viet Nam Living Standards Survey - VHLSS). GSO uses two different methods to measure poverty - one based on official poverty lines (adjusted for inflation) applied to per capita incomes, and the other using an approach developed by a joint GSO and World Bank team in the late 1990s. The GSO - WB poverty line was constructed using a standard Cost-of-Basic-Needs methodology, based on a reference food basket for poor households anchored in caloric norms (2,100 kilocalories per person per day) plus an additional allocation for essential nonfood needs based on consumption patterns of the poor. The GSO-WB line was kept roughly constant in real purchasing power since the late 1990s, and applied to per capita consumption measured in successive rounds of the VHLSS to estimate changes in poverty over time at the national, urban/ rural, and regional level. The GSO-WB poverty lines are independent of budget considerations and used only to monitor changes in poverty over time.

Although MOLISA and GSO-WB came up with different estimates of poverty incidence, both show excellent progress in the poverty trends in Vietnam. The proportion of people with per capita expenditures under the GSO-WB overall poverty line has dropped significantly from 58 percent in 1992 - 1993 to 37 percent in 1997- 1998 and 29 percent in 2002. If the food poverty line is adopted, there has been a decline in the poverty rate from 25 percent in 1992 - 1993 to 15 percent in 1997 - 1998 and then to 10 percent in 2002. Figure 1 and 2 shows that poverty has declined in all 7 broad geographic regions of Vietnam during the period 1992 - 2002 and 1998 - 2008.
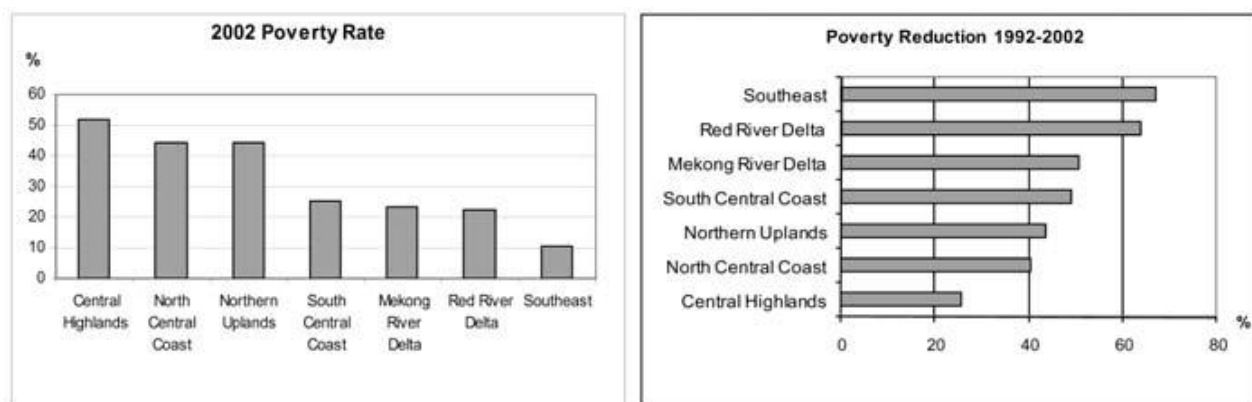

Figure 1. Regional Incidence of Poverty, Poverty Reduction in 1992 - 2002
Source: Dang Kim Son and Nguyen Ngoc Que (2003)

Although the poverty rate has been declined dramatically from 64.5% in 1998 to 31.6% in 2008, the Northern Upland remains the region having highest incidence of poverty in Vietnam.

The updated GSO-WB poverty line for 2010 is VND 653,000 per person per month (US $2.26 per person per day, 2005 PPP), which is substantially higher than the original GSO-WB poverty line. The increase reflects improvements in the quality of the food reference basket (fewer calories from rice, more consumption of proteins, vegetables, and fats) and a higher allocation for essential nonfood spending, including housing and durables. The updated "extreme poverty" GSO-WB line is VND 435,000 per person per month (US $1.50, 2005 PPP). These compare to new official poverty lines (announced in September, 2010) of VND 400,000 per person per month (US $ 1.29, 2005 PPP) for rural areas and VND 500,000 per person per month (US $ 1.61, 2005 PPP) for urban areas.
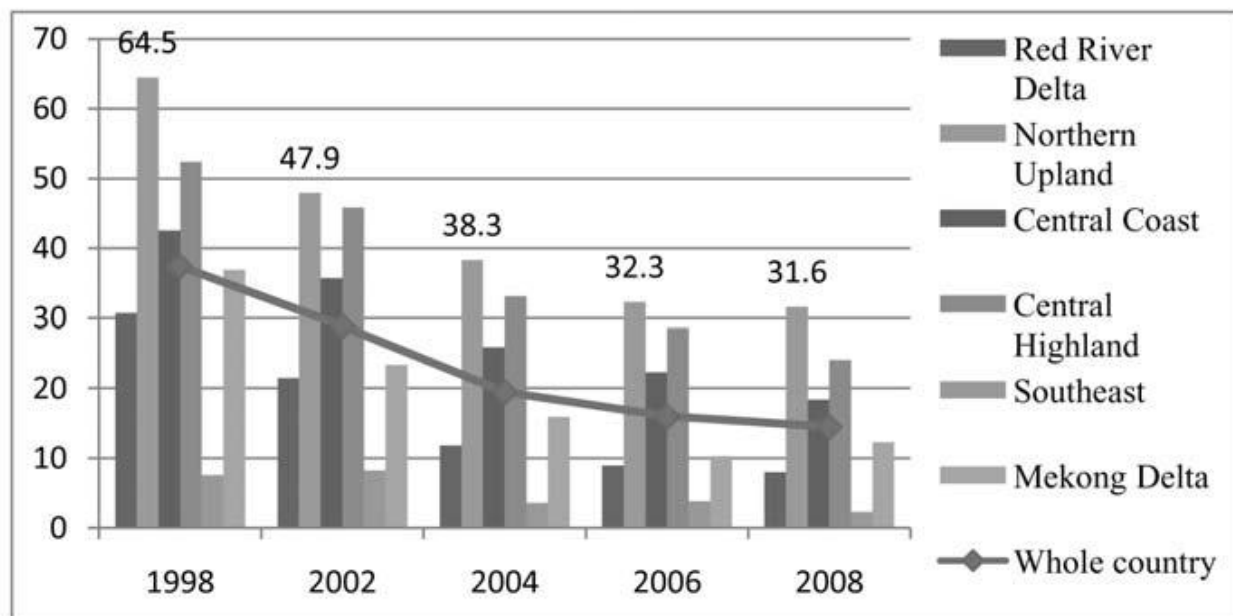

Figure 2. Incidence of Poverty, Poverty Reduction in 1998 - 2008

Source: Based on GSO-WB

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According to the updated GSO-WB poverty line and methodology, 20.7 percent of Vietnam's population is still poor in 2010, including 27 percent in rural areas and 6 percent in urban areas, and 8 percent of the population remains extremely poor (see Table 1). This compares to an official poverty rate of 14.2 percent based on Vietnam's official urban and rural poverty lines set for the 2011-2016 Socio-economic Development Plan.

Table 1: New Poverty Estimates for 2010 by Region and Urban/ Rural Areas

	WB-GSO Poverty Estimates				Official Poverty Estimates		Population Shares (%)
	Poverty		Extreme Poverty				
	Poverty Rate (%)	Contribution (%)	Poverty Rate (%)	Contribution (%)	Poverty Rate (%)	Contribution (%)	
All Vietnam (national)	20.7	100	8.0	100	14.2	100	100
Urban	6.0	9	1.5	6	6.9	6	30
Rural	27.0	91	10.7	94	17.4	94	70
Red River Delta	11.4	12	2.8	8	8.4	13	22
East Northern Upland	37.3	21	17.9	26	24.2	20	11
West Northern Upland	60.1	9	36.5	14	39.4	9	3
North Central Coast	28.4	16	9.7	15	24.0	20	12
South Central Coast	18.1	7	5.9	6	16.9	10	9
Central Highlands	32.8	10	17.0	13	22.2	9	6
Southeast	8.6	7	3.1	7	3.4	4	18
Mekong Delta	18.7	17	4.8	11	12.6	17	19

Source: WB (2012).

Official estimates suggest higher poverty in urban areas, also in North Central and South Central coastal regions. The GSO-WB poverty rate is substantially higher in rural areas, in part due to differences between official poverty lines and the new GSO-WB poverty line, but also due to differences in methodology. The new 2010 poverty profile differentiates between the total poor (individuals living below the GSO-WB poverty line) and the extreme poor (individuals whose per-capita expenditures are less than the extreme poverty line). In 2010, 20.7 percent of the population are poor and just over a one-third of these (8 percent of the population) are extremely poor.

The Northern Uplands (East-northern and West-northern), Central Highlands and North Central Coast the three poorest regions with highest poverty rate. However, three regions account for almost 63 percent of Vietnam's poverty are: Northern Uplands (30 percent), North Central Coast (16 percent) and Mekong Delta (17 percent). The Northern Uplands also be region that has highest extreme Poverty rate, specifically the West Northern sub-region (36.5% of its population).

Although Vietnam's 53 ethnic minority groups make up less than 15 percent of the population, they accounted for 47 percent of the poor in 2010, compared to only 29 percent in 1998. Using a new poverty line that better reflects living conditions of the poor, 66.3 percent of minorities are poor in 2010 compared to only 12.9 percent of the Kinh majority population.

3.2. The Forest Land and Resources

Viet Nam is a tropical country located in the Indochinese peninsula of Southeast Asia. Geological make-up is with complex topography, 3/ 4 of the country's area is mountains and hills. Natural environment is much differentiated giving rise to many ecological regions with high biodiversity. The total area of the country is about 33 million hectares, of which 57.6% is classified as forest land. In 2012 Vietnam has some 19.2 million hectares of forest land, of which 13.4 million hectares are forested, the remainder being degraded or bare land. Of the forested land, 10.4 million hectares are natural forests and 3.0 million hectares are plantations. Forest land is managed according to one of three functional categories: special-use forests comprising 2.3 million hectares; environmental protection forests comprising 5.7 million hectares; and production forests comprising 8.3 million hectares (GSO, MARD & WB).

Forest resources of Vietnam are spread across areas. Forest resource is very rich in the number of plant and wildlife species with various forest types: mangrove, melaleuca leucadendron forest, forest on fresh water marsh, broad-leaved evergreen forest, semi-deciduous forest on low land, limestone mountain forest, alpine evergreen forest and mixed

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pine forest. Statistical data shows that Vietnam has over 7,000 high vascular tree species. As predicted by botanists there are at least in Vietnam 12,000 plant species, of which about 2,300 species are already used by the people as food, food stuff, medicine, animal feed, timber, essential oil and others.

Fauna of Vietnam is very rich. There have been listed 275 mammal species, 825 bird species, 180 reptile species, 80 amphibian species, thousands fish species. The Fauna of Vietnam is not only rich in species composition but also has many unique features representing South East Asian region. Mean biodiversity index is 6.2% of the world. In 1992 The World Conservation Monitoring Center (WCMC) classified Vietnam 16th in the world in biodiversity (Hoang Lien Son, 2002).

3.3. Forest Resource Use and Poverty Allevation

Sunderline and Huynh Thu Ba (2005) defined three key linkages in the relationship between poverty alleviation and the forest sector in Vietnam, which can be described succinctly as follows:

1. There are important cause and effect relationships between the transformation of rural livelihoods and dramatic changes in forest cover because they occupy shared geographical space and have occurred in roughly the same time period.

2. Poor people in remote rural areas tend to have a relatively high level of dependence on goods and environmental services from natural forests for their sustenance.

3. In spite of their dependence on forests, some rural people have derived great benefit from the elimination of forest cover through increased access to arable land and through conversion of timber and other forest products into income and capital.

Rural communities in Viet Nam in general, in Northern upland region in particular, have a long tradition of using forest resources for food, fuel, building materials and medicines. In addition to these direct forest benefits, many communities rely on forests for soil and watershed protection, the regulation of the hydrological cycle and agricultural production, and other important cultural, social, and spiritual values. For the natural resource dependent

poor, particularly in Vietnam's mountainous regions (approximately 9 million of the total 25 million people living in rural uplands), forests represent a very significant proportion of a given household's income and asset base. This fact is also illustrated in the Northern upland region. Figure 3 shown that income from agriculture and forestry accounts for nearly 40 percent of the region's household income.

In Vietnam, some 5% of all households or 25 million people depend on forest resources to support their livelihoods. However, some resarches shown that, typically such households are poorer than non-forest dependent households - a high correlation exists between forest cover and incidence of poverty. There is a mechanical correlation between poverty, fragile soils, accessibility or loss of forest resources that is largely due to association of uplands with high poverty incidence. There is a strong correlation between country's forested and poorest areas and there is an added dimension in that upland ethnic minority groups are disproportionately represented amongst the most chronically poor (Swinkels & Turk, 2006). Thus for many of the poorest, most vulnerable and marginalized groups in Vietnam, the manner in which forests are allocated, managed, protected and used is of central importance to their health, well-being and sustainable development.
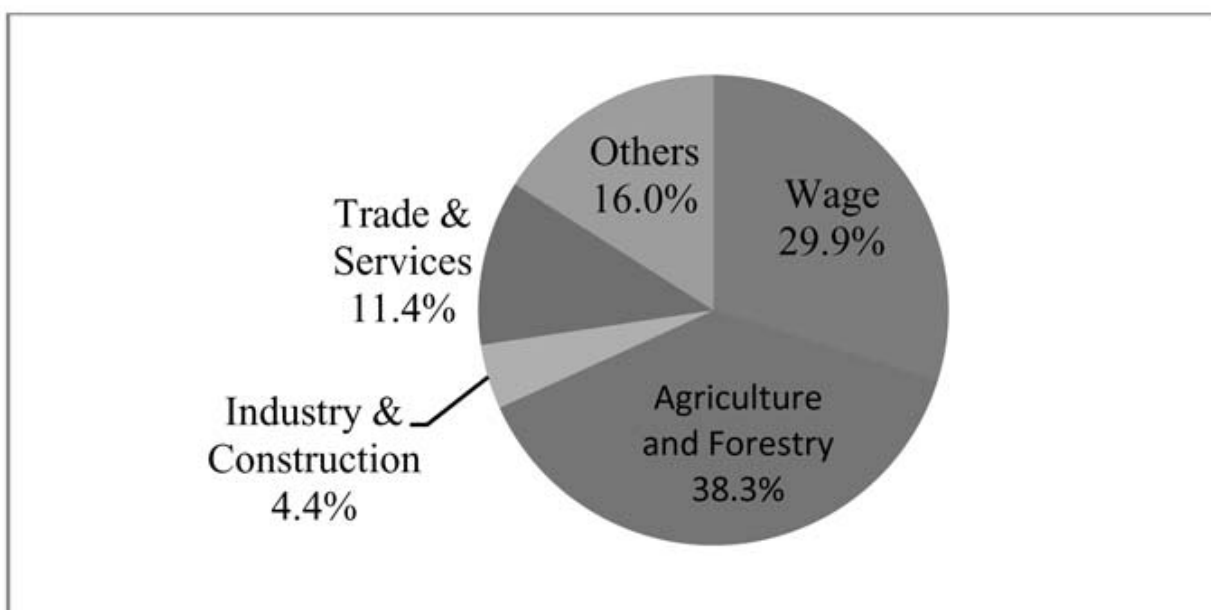

Figure 3: Income Sources of Households in Northern Upland Region
          Source: Based on GSO, VHLSS (2008)

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The Northern upland region includes two quite distinct sub-regions: East Northern and West Northern. The lives of people living in areas with rugged terrain is very difficult. Northern upland region has the second largest forest area in the country but also the region with the highest poverty rate in the country, although the poverty rate has declined during the last years. The region is inhabited by millions of people with many different ethnic groups, with low literacy levels, backward farming methods, slow economic development and life is more difficult. Forests are the main source of income of ethnic minorities, is an important basis for population distribution, regulate labor and poverty alleviation. The quantity of wood harvested in the Northern upland region account for about 1/3 of the country's quantity and had been increased over the last 15 years. (see figure 4)
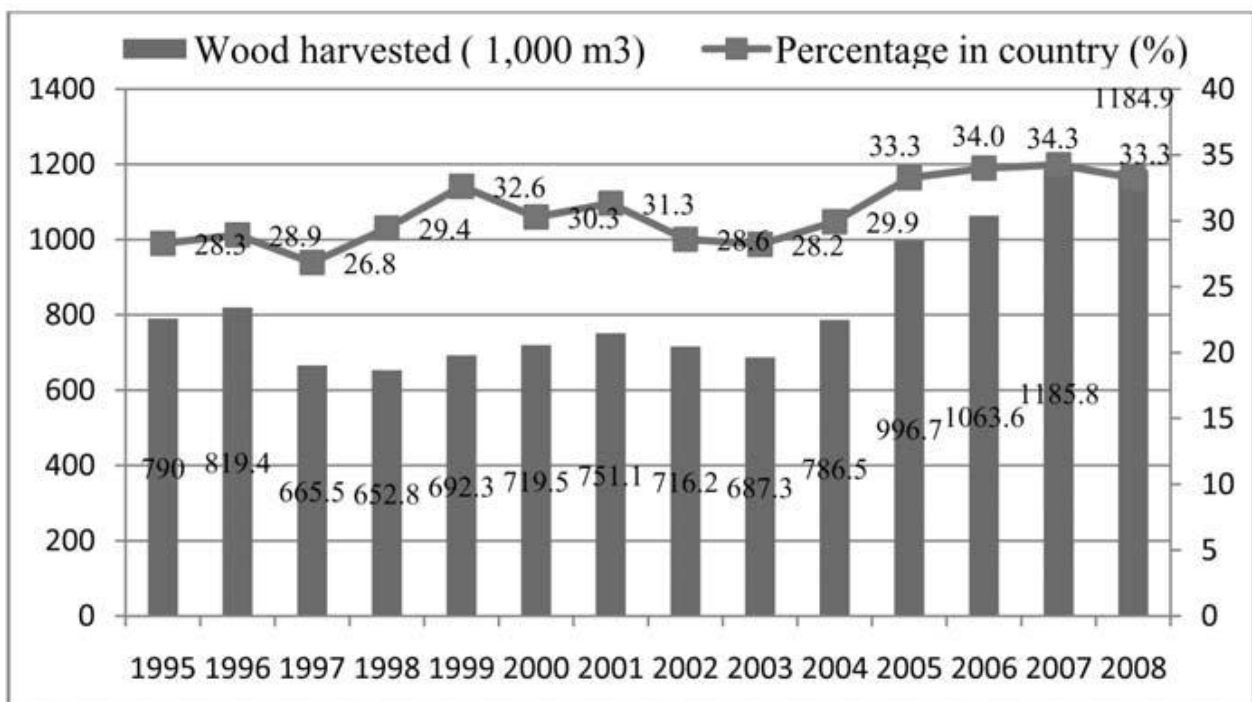

Figure 4: Wood harvested in the Northern Uplands, 1995 - 2008

Source: Based on GSO and MARD

For people living in and nearby the forest, the forest is an important source of livelihood. People can exploit forest resources such as firewood, timber, animals, pharmaceuticals, bamboo shoots, bee honey, ... to serve the needs of life. Moreover, under the management of the forest so that people will state resources for the immediate needs of life and to earn the most from the forest. This may result in forest decline, both quantity and quality. Once the source of livelihood been exhausted, it may cause difficulty to the people life and increase poverty rate.

Despite the high levels of dependency on forest resources amongst poor, upland ethnic minority groups only a small percentage of the most vulnerable ethnic minority farmers are able to derive a viable livelihood from forestry and key underlying cause here is inequitable access to land or productive land. Government-supported forest land allocation (FLA) to communities, households and individuals have had few observable and positive effects on poverty alleviation; indeed there is even a danger that FLA processes might negatively impact poverty alleviation efforts. FLA has generally created two separate groups of actors at the local level: local people in possession of legal rights to forest and local people without such rights. However, forest resources are inequitably distributed even among those with forest tenure rights. Power relations and access to information have shaped the distribution of forest resources among local forest recipients. Poor and disadvantaged households, who have inadequate access to power and information, have often been left out. For instance, in Hoa Binh, power relations have resulted in FLA providing the wealthier village households with access to forests. Furthermore, material benefits derived by poor households are often minor in economic value, as these stakeholders often lack the resources necessary to derive products of high economic value.

Forest sector and socio-economic development policies in Vietnam include a number of key objectives which prioritise poverty alleviation, in particular targeting ethnic minorities and the most vulnerable groups in society. However, there are a number of policy implementation issues which are affecting livelihood outcomes for the poor in real terms. The areas of high incidence of poverty (ratio of poor to total population) in Viet Nam tend

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to overlap with the location of remaining stands of natural forest. Note that the areas of high incidence of poverty are concentrated in the northern upland and central highlands, and likewise the remnants of forest cover. (One important exception is the northwest corner of Vietnam, near the Chinese border, which is among the poorest in the country yet lacks forest cover. This is an area of relatively recent and rapid deforestation). Such areas are also predominantly populated by ethnic minority groups and thus poverty has an added social dimension.
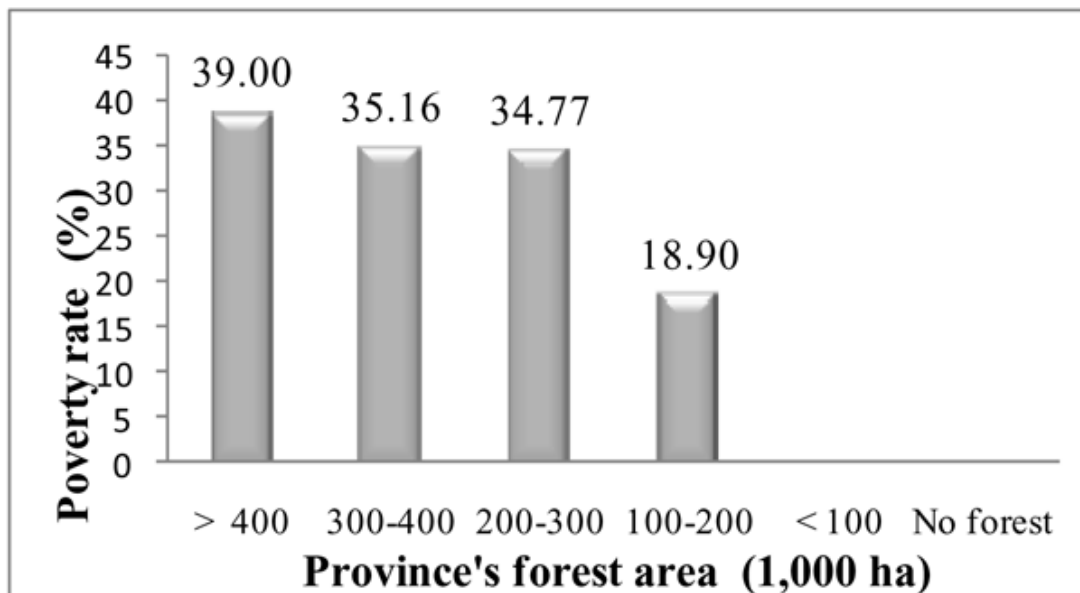

Figure 5:Households' Poverty Rate by Groups of Province's Forest Area in Northern Upland
Region Source: Based on VHLSS and MARD

The largest losses of forest land were in provinces/districts with high poverty incidence. Poverty rates in all provinces of the region are well above the Viet Nam average. Conversely, poverty incidence has been associated with an increase in forest land area in the northern upland areas during the same period. This counters the suggestions that the poor

are one of the causes of deforestation or that they are poor because they are significantly affected by deforestation. It is however clear that in the poor provinces, the poor do not benefit enough from forestry resources, whether they are logged or protected, to raise their incomes above the poverty line.

The poorest of the poor are often located in areas that are remote from urban areas and from transportation thoroughfares, and this isolation and relative lack of contact with the wider economy is functionally related to their degree of poverty. Likewise, pockets of remaining natural forest tend to survive precisely because of their relative isolation from urban centers and from large roads. The patterns of socioeconomic development experienced in Viet Nam have tended to concentrate poor people and remaining stands of natural forests in roughly the same geographical areas, with some important exceptions in the West Northern areas. Remote forested areas have been colonised by poor people who have limited livelihood prospects in the crowded lowlands. It is not just ethnic minorities who now live in the remote uplands, but also the Kinh majority. Poor people in remote rural areas tend to have a relatively high dependence on access to forests for their livelihoods not just because of the geographical linkage but also because there are attributes of natural forest resources (especially of non-timber forest products or non-forest timber products) that lend themselves well to exploitation by the poor (Sunderlin & Thu Ba, 2005).
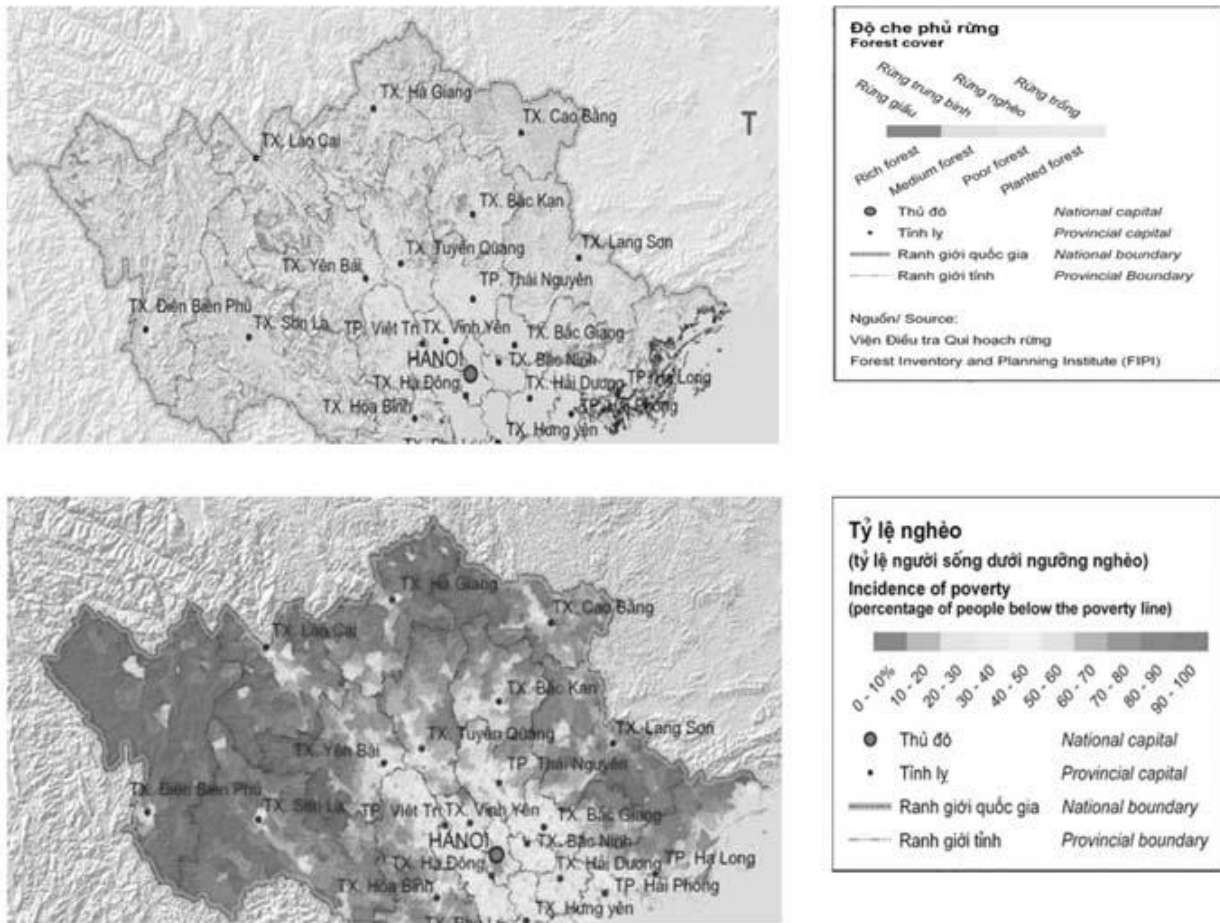
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Figure 6: Distribution of forest coverage and poverty rate in Northern upland region
   Source: MARD and GSO (2008)

Many of Vietnam's high elevation areas can be described both as environmentally fragile areas and as poverty traps. Forest resources are spread across mountainous and hilly areas. The Cordillera, with its ridge forming most of the border between Viet Nam and Laos, is a rich area of biodiversity. Almost all protected areas are located in the high elevation regions. Mountainous districts have 55 percent of "commercial forests" and 51 percent of "environmental forests". They are also home to 47 percent of Vietnam's 10.5 million ethnic minority people. The severity of poverty (or poverty depth) is substantial in districts with highest elevation. Poverty rates have decreased significantly between 1999 and 2004, but more slowly than elsewhere. The six provinces with more than 50 percent of the poor

population in 2004 are the three provinces of the West Northern sub-region, the three mountainous border provinces in the East Northern region, and Bac Kan Province in the Cau River basin (MARD).

3.4. Impacts of forest management practices on livelihood and well being of ethnic populations

According to World Bank and Forestry Directorate, MARD (2011), livelihoods (access to resources/ land, jobs, rights to exercise community management) and cultural diversity (ethnic minorities lifestyles, habits, languages etc.) can be significantly affected by the following forestry management practices:

- Land allocation for households, communities, including community forest management of natural forests and plantations; Land allocation to state and private companies;

- Conversion of forest land to other uses such as hydropower, aquaculture, roads and mines; Conversion of forest land to agriculture (rubber, coffee, palm oil and biofuels in the future);

- Plantations on barren land; Livestock grazing;

- Extraction of forest timber and non-timber products and Illegal logging, wildlife and plant poaching; Cultivating agricultural species in natural forests;

- Supply of quality seed; Indigenous and exotic seedlings;

- Harvesting in planted forest;

- Selling and marketing of forest products; and,

- Extension programs for sustainable forest management.

3.5. Inter-linkages between poverty and forest degradation

Mostly, in developing countries, poverty is stated as one of the underlying causes of deforestation and deforestation in turn aggravates the level of poverty. In fact, the link between poverty and deforestation arises from the strong direct dependency of poor local households on land and associate forest resources.

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Results of the linear regression model (1) show that poverty rate depends on factors of forest area changes in Northern Upland region.

$$Y = 5,946 - 0,895*X_1 + 1,276*X_2 + 3,243*X_3 - 0,014X_4 + 0,238X_5$$

First, poverty rate Y is inversely related to the forest coverage X1. When the forest coverage rate increases, the poverty rate decreases. In recent years, forest coverage rate is more advanced along with efforts to reduce poverty, especially in remote and difficult areas. The coefficient $\beta1 = -0.895$ showed that when the percentage of forest coverage increased by 1 % (other factors constant), the poverty rate fell by 0.895 %.

Second, the rates of forest fires and forest destruction also affect the poverty rate: the coefficient $\beta2 = 1,276$ saying that, when the rate of forest fires increased/ decreased by 1% (other factors constant), the corresponding poverty rate increased/ decreased with a faster speed of 1,276 %. With the coefficient $\beta3 = 3.243$, when the rate of forest cleared increased/ decreased by 1% (other factors constant), the corresponding poverty rate increased/ decreased to 3.243 % .

In regression model (2), the forest coverage X_1 is inversely related to the proportion of poverty rate Y.

$$X_1 = 5,51 - 1,103*Y + 0.045X_4 - 0,157X_5$$

The value $\alpha1 = -1.013$ shows that the forest cover decreased 1,103% when poverty rate increased by 1% (other factors constant). Thus, the percentage of forest coverage has decreased faster than the speed of growth of the poverty rate.

Regression (3) illustrates the proportional relationship of poverty rate Y with the rate of forest destruction (dependent variable X_3).

$$X3 = -0,55 + 0,02*Y - 0,11X_4 + 0,55X_5$$

The coefficient $\alpha2 = 0.02$ showed that, when the poverty rate Y increased 1% (other factors constant), the rate of forest destruction (X3) also increased, but to a less amount of 0.02 %

The quatification of the relationship between poverty and forest coverage change in the Northern upland region is important in finding solutions to solve the harmony of the two elements. The results could help to change the previous prerceptions of trade-off between the two elements in the development process. It is necessary to solve the problems of poverty alleviation simultaneously with forest conservation in order to achieve sustainable development.

4. Conclusions and Implications

The relationship between poverty alleviation and the forest sector as well as the ways that forest resources contributes to poverty alleviation in Northern rural upland areas of Vietnam was examined and analysed in this paper. Findings from the study allow to draw implications of livelihoods derived from forests, which emphasize the roles of the Government of Viet Nam and Ministry of Agriculture and Rural development in:

- Adopting a country-wide policy and program on community forest management which should become one of the prime means for forest protection and provision of alternative livelihoods for forest-dependent communities;

- Expediting the allocation of production forest land to communities and households and supporting their livelihoods;

- Continue supporting forest plantation by small holders with preferential treatment of poor household and ethnic minority groups;

- Encouraging the establishment of forest farmers' cooperatives (or cooperative structures) for the management and marketing of planted timber products; and

- Promoting participatory planning for livestock, raising agroforestry and industrial crops at local level.

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References

ADB (2000), Study on the Policy and Institutional Framework for Forest Resources Management, Asian Development Bank, TA No. 3255 - VIE.

Dang Kim Son and Nguyen Ngoc Que (2003), Poverty Mapping Activities in Vietnam, the Ad Hoc Expert Group Meeting in BangKok, 18-20 August 2003 on Poverty Mapping and Monitoring using Information Technology.

FAO (2003), State of the World's Forests 2003, Food and Agriculture Organization of the United Nations, Rome.

GSO (Several years), Statistical Yearbook, General Statistical Office, Statistical Publishing House, Hanoi.

GSO (2008), Households Living Standards Survey (VHLSS), General Statistical Office, Hanoi.

Hoang Lien Son (2002), Forest Resource Management in the Direction of Sustainabe Development in Vietnam.

Jamieson NL, Cuc LT, Rambo TA (1998), The Development Crisis in Vietnam's Mountains, East-West Center Special Report.

MARD/ DFD (2001), National Five Million Hectare Reforestation Programme (1998-2010), Ministry of Agriculture and Rural Development, Department for Forestry Development, Hanoi.

Minot, N., B. Baulch, M. Epprecht and the Inter-MinisterialPoverty Mapping Task Force (2003), Poverty and Inequality in Vietnam: Spatial Patterns and Geographic Determinants, Hanoi: International Food Policy Research Institute and Institute of Development Studies.

Swinkels and Turk (2006), Explaining Ethnic Minority Poverty in Vietnam: a Summary of Recent Trends and Current Challenges.

WCED (1987), Our Common Future, World Commission on Environment and Development, Oxford University Press.

William D. Sunderlin (2003), Poverty Alleviation and Forest Conservation: A Proposed Conceptual Model.

William D. Sunderlin and Huynh Thu Ba (2005), Poverty Alleviation and Forests in Vietnam, Center for International Forestry Research (CIFOR), Indonesia.

World Bank (2001), World Development Report 2000/2001: Attacking Poverty, Oxford University Press.

World Bank (2012), Well Begun, Not Yet Done: Vietnam's Remarkable Progress on Poverty Reduction and the Emerging Challenges, WB in Vietnam, Hanoi.

World Bank and Forestry Directorate, MARD (2011), Prior Strategic Environmental Assessment for Vietnam Forestry Master Plan 2010 - 2020, International Centre for Environmental Management, Hanoi, Vietnam.