MARKETIZATION IN POOVERTY-RIDDEN AREAS: ANALYSIS OF HOUSEHOLD SURVEY IN LAI CHAU AND HA GIANG PROVINCES

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1. INTRODUCTION

Industrialization and modernization of agriculture and rural areas has been one of the Government's major strategies since *Doi Moi* policy was adopted. The Government has pursued, not only to introduce modernized agricultural techniques, but also to change the whole economic structure in the rural areas to a more 'market oriented' one. Since Decision 10 was promulgated in 1988, individual farmers have been bestowed rights to manage their own agricultural production, which has lead to a massive increase in the welfare of rural households. In 1993, the Decree of the 5th Plenum of the 7th term of the Communist Party Central Committee gave basic directions towards the industrialization and modernization of agriculture sector and rural economy. In 2000, Decision 3/2000/NQ-CP which commends promotion of large-scale farms (*trang trai*) was promulgated. In the same year, the 10 year (2001-2010) plan for agriculture and rural development set orientation of agricultural development in Vietnam to be more sustainable, efficient, competitive, and high-value added. The plan set ambitious objectives for the average annual growth of agricultural output at 4% – 4.5%, and average product value of agricultural land at 2000 USD per hectare. In 2002, Decree 80/2002/QD-TTg was issued aiming to promote production contracts for high quality commercial agricultural products between food processing companies and farmers. Moreover, thanks to the new Land Law, revised in 2003, the land market is becoming more liberalized, which will enable more capital downpour to large scale farms and the industrial sector in rural areas. These policies were indicative of a drastic swing in priority from an increase in agricultural production during the 1990's towards more 'marketization' (*hang hoa*) of the rural economy.

Some regions have achieved remarkable progress in line with these policies. In the Mekong Delta region, cereal production in 2002 (17.8 million ton) was 48% of the total national production, and the agricultural output (44,269 billion Dong (VND) at constant 1994 price) accounted for 36%. In the South East region, where Ho Chi Minh City is located, the rural population accounts for only 46.7%.

On the other hand, some poor areas, especially the Northern Uplands region[1] still lag behind. In the Northern Uplands, the increase in agricultural output value between 1990 and 2000 was 82%, far below the national average (97%). Cereal production per capita in 2002 was 317kg, compared to the national average of 436kg. Incidents of poverty in this region are still the highest in the country.

The main objective of this Chapter is to describe how the nation's directives of 'marketization' of the rural economy have intruded at the household level in poor communes in the two provinces of the Northern Uplands, namely Lai Chau and Ha Giang. This report, using the results of household research conducted from June to October 2004, aims to evaluate how much of the agricultural production of rural households is commercialized, how much their livelihoods count on cash income, and how much working time they spend on 'market-oriented' economic activities. This report gives special attention to the agricultural production patterns and labor allocation within each household.

This Chapter is organized as follows: Section 2 provides background information about the research. Section 3 contains general data on the surveyed households, from 439 households in the two provinces that are focused on. The data obtained from similar research on 100 households in Ha Tay province is also presented. This similar research was conducted in a more 'modern' rural commune, Dan Hoa, about 30km from Ha Noi. This 'modernized' commune has better access to markets of wage labor, agricultural products, self-employment, land, credit, etc.. By using this comparison with such a better-off commune in the Song Hong (Red River) Delta, we can draw clearer pictures of the characteristics of livelihoods in poor mountainous communes. The main analysis in regard to the objectives of this report is presented in Sections 4 and 5. Section 4 observes patterns of 'marketization' of livelihoods in accordance with income categories. Section 5 discusses the relationship between socio-economic characteristics of households and 'marketized' livelihoods.

[1] In 1990, the Northern Uplands region consisted of 16 provinces. But in 1999, Vinh Phu and Bac Ninh became provinces of the Red River Delta. The data in 1990 is also that of the same 14 provinces as 2000 or 2002.

2. BACKGROUND OF THE RESEARCH

2.1 Household surveys in Vietnam: their advantages and disadvantages

In Vietnam, there exist some sets of household survey data[2]. Among the already existing household surveys, one of the most widely used surveys is the Vietnamese (Household) Living Standard Survey (V(H)LSS) of the General Statistics Office[3]. There have been various studies using the V(H)LSS data, such as on government's safety net programs (Litvack and Rondinelli [1999], van de Walle [2002]), on spatial disparity (Minot and Baulch [2002]), on growth and poverty reduction (Glewwe et. al. [2000], Glewwe et.al. [2004]), etc.. It is true that studies on V(H)LSS data are insightful and there still exists room for more in-depth analysis of the V(H)LSS data, but we also recognize the necessity to implement research designed to analyze specific poverty-related issues. Huge datasets of V(H)LSS results may be useful in giving a national-level comparison (among, for example, a population divided into five income quintiles, seven regions, or 'rural'-'urban' areas), but might not be suitable to identify specific difficulties in specific areas. Moreover, in the rapidly improving socio-economic situations of poor households and in poor areas, we cannot rely too much solely on the V(H)LSS surveys which are not necessarily designed for poverty study. The V(H)LSS data publicly available[4] is that of already 7-8 years ago (at the time of publishing), and they include many questions not relevant to the poor (or poor areas), or which are hard to answer for the rural poor.

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[2] For example, in 1990, the GSO organized a survey on income and expenditure of 6,457 households in 5 provinces (Dao The Tuan [1995]). Similar surveys were also conducted by the GSO in 25 provinces in 1990 and in 14 provinces in 1992 (Nguyen Van Thieu and Nguyen Thi Hang [1993]).

[3] The first VLSS survey was conducted in 1992 with the financial and technical assistance of the World Bank, UNDP and the Swedish Government (SIDA). 4,800 households from 51 provinces and cities had been selected as survey samples. The number of the surveyed households was increased to 6,000 in 61 provinces during their second survey in 1998, and the third survey in 2002 covered 75,000 households in some 61 provinces (General Statistics Office [1994], [2000], [2004]). The name of the third survey was changed to 'Vietnam Household Living Standard Survey – VHLSS' (therefore, this report describes the surveys as 'V(H)LSS').

[4] Although access is still limited and permission and fees are required for their use (as property of the Government of Vietnam), the datasets of the VLSS 1993 and 1998 can be obtained from the General Statistics Office of Vietnam. Complete sets of questionnaires (households, commune, school, clinic and price questionnaires) and handbooks for research teams are available. For further information, see the World Bank website, http://www.worldbank.org/lsms/country/vn98/ (as of January 2005).

Information in local context would be needed to supplement the findings of the existing V(H)LSS studies.

This study uses micro economic terms and concepts, as well as econometric methodologies for its analysis. However, the research results may lack the rigorousness in a micro economic sense, because the collected data is not holistic enough (one would not say 'not correct enough') to conduct a statistical analysis. We, instead of pursuing statistical rigorousness, put priority on giving attention to local context in the collection and analysis of data. Local contexts are considered in three ways. First of all, this study has chosen questions which are answered with less difficulty by rural households. We conducted 'quick' research so that up-to-date first-hand information with specific interests could be obtained smoothly, and research activities themselves did not interrupt the daily lives of the researched households. This study has collected quantitative data through simplified questionnaire surveys. Questionnaire surveys, using 10 page questionnaires (much shorter than the 112 page questionnaire of the VLSS 1998 survey) focused on the agricultural production, income and working time of the households in the two provinces.

Secondly, local contexts are considered in our choice of analytical means. Instead of using income quintile to categorize households, we divide the sample into 10 income groups (Section 4). This is because we observed relatively egalitarian composition of income within the communes. The rich and the poor made up for even less than 20% of the samples. We also do not simply try to find the determinants of one's living standard by seeking correlations with possible explanatory variables. The study tries to understand the factors of differentiated livelihoods by gathering in-depth qualitative information, through follow-up interview surveys with the researched households, about institutional arrangements, customs, and patterns of behavior of their economic activities.

Thirdly, local contexts are considered in the interpretation of the analytical results. Qualitative information helped to explain the possible rationale that local residents may hold behind their economic activities, such as crop choice, labor allocation, investment, and marketing effort among other factors.

2.2 Research site selection procedure

We selected Lai Chau and Ha Giang provinces as our research sites, for two main reasons. Firstly, Lai Chau and Ha Giang provinces are located in the Northern Uplands regions where incidents of poverty are highest among the seven geographical divisions in Vietnam. Among the Northern Uplands provinces, Lai Chau and Ha Giang are similar in many senses. As can be seen in Table 1, poverty rate, despite recent rapid improvement,

is still far higher than the national average[5].

Table 1: Poverty rate in Lai Chau and Ha Giang provinces

Unit: %

	1998	1999	2000	2001[2)] (year end)	2002	2003
Lai Chau	34.7	28.9	23.4	41.3	36.8	31.8
Ha Giang	31.2	22.0	18.0	22.8	17.9	15.0
National average[1)]	15.7	13.1	10.0	14.4	11.6	9.51

Note: 1) Figures on the national average from 1998 to 2000 are based on the 2001-2005 5 year HEPR plan (Government of Vietnam [2001]). Remaining data are from MOLISA [2004].

2) Poverty rate increase in 2001 is accounted for by MOLISA's change in its definition of poverty. The new poverty line (monthly expenditure level per capita) was lifted to 100,000VND (from 70,000VND or 20kg of rice) in rural lowland areas, and to 80,000VND (from 55,000VND or 15kg of rice) in rural mountainous areas.

Source: Government of Vietnam (2001), MOLISA (2004).

According to the data of the Ministry of Labour, Invalid and Social Affairs (MOLISA), GDP per capita (nominal price) in 2000 was 1,992,900 VND in Lai Chau (3rd lowest in the country) and 1,721,200 VND in Ha Giang (lowest in the country), where the national average is 5,688,700 VND (MOLISA [2004]). Agricultural production performance remains at a low level. Per capita cereal production in 2002 was 312.8kg in Lai Chau and 345.5kg in Ha Giang, both lower than the national average by more than 100kg. According to the data of the latest Population and Housing Census in 1999 (GSO [2001]), Lai Chau province has a total population of 587,582, in which ethnic peoples (non-Kinh ethnicity) account for 83.1%. The majority of these ethnic peoples are

[5] At the beginning of 2004, Lai Chau province was split into two new provinces. The new Lai Chau province is the northern half of the old province, while the southern half has become Dien Bien province. The new Lai Chau province also consolidated one district from Lao Cai province. It should be noted that the data provided in this section refers to the old provincial borders. According to a poverty 'mapping' study (The Inter-Ministerial Poverty Mapping Task Force [2003]), the new Lai Chau province includes districts where poverty incidence is higher (Phong Tho, Sinh Ho, Muong Te and part of Muong Lay), and one of the poorest districts in neighboring Lao Cai province (Than Uyen district). In this regard, it is certain that socio-economic as well as poverty conditions in the new Lai Chau province are more severe than the data presented here. The three communes researched in this report belonged to Phong Tho district. However, the District was split into two new districts, namely Phong Tho district (where Khong Lao commune is located), and Tam Duong district (where Bang Giang and Ho Thau communes are located).

Thai (35.1% of the total population) and Hmong (29.0%). The ratio of ethnic peoples among a total population of 602,525 in Ha Giang province is 87.9% where Hmong (30.5% of the total population), Tay (25.4%) and Dao (15.4%) are the major ethnic groups.

The second reason why we chose these two provinces is that eligible local partners were available. This study required partner institutions at the provincial level to facilitate research activities since we had envisaged various difficulties such as security, local languages, and complicated government procedures. The partner institutions were also required to provide us with basic knowledge on the poverty situation, economic status, local authorities' policies, and socio-cultural uniqueness of the province. In this sense, the Departments of Labor, Invalid and Social Affairs (DOLISA) of the two provinces were ideal partner institutions due to their rich knowledge of poverty study and implementation of locally initiated poverty reduction programs. Also both provinces were relatively new; Ha Giang was established in 1991, and new Lai Chau in was only created in 2004. The provincial authorities have shown great interest in this study which helps to identify the present socio-economic status of the poor. The results of the study could help to show the potential for future directions of the provinces.

2.3 Commune and household selection

The study conducted questionnaire surveys in three communes in each two provinces. The criteria for selection of the communes were: 1) communes classified as those with 'most difficulty' (under the Decree 1232/1999/QD-TTg), 2) a majority of residents from ethnic groups, and 3) various ongoing poverty reduction programs being currently in place. The three communes in each province include a commune located close to the major markets in the provincial capital, a commune located relatively far from the major markets but on major trunk roads, and a commune far from major trunk roads. The names of the communes and the number of households researched are listed in Appendix I.

In conducting this study, it was requested to select sample households, aiming for the total number in each commune to be the same, based on a random sampling procedure. Even though, due to many constraints, such as geographical conditions, physical access, weather, time constraints, etc., strictly ideal random sampling was not achievable during the research, information from a relatively wide range of households was collected. The number of samples in Lai Chau is 209, and 230 in Ha Giang. The questionnaire surveys were commissioned to the DOLISAs of each province that have rich experience of household research activities for their planning of poverty reduction programs.

After the questionnaire surveys, in-depth interview surveys were conducted in each researched commune. Data on communes' socio-economic conditions, poverty reduction programs, as well as qualitative information on some sample households (minimum 5, maximum 11 per commune) relating to agricultural production methods, production sales, labor acquisition, survival strategies when in facing difficulty, etc., was also gathered.

2.4 Calculation of income and working time

The questionnaire surveys aimed to collect household data, concentrating mainly on income, and labor. Income is calculated as the sum value of various agricultural products and by-products, cash income from non-agricultural enterprises, wages, benefits from social security programs, remittance from family members or relatives, and other income. The research did not ask for detailed information about costs of production, sales and transportation, or physical assets of the household. Wages for hired labor and incomes from non-agricultural self-employment activities are net revenues in which related costs are deducted, but generally, the data 'income' in this report is, therefore, the gross value from economic activities, and can be interpreted as the household's estimated production capacity rather than real expendable value. Information on cost is, in general, crucial, and any lack may result in a technical weakness of the research findings. However, it is assumed that the cost calculation for agricultural production be relatively difficult for households whose economy is more self-sufficient and recycling-based. For example, many communes still follow labor exchange customs, mixed with hired laborers, who are paid in-kind (typically, rice plus 3 meals). Many households still use livestock excreta as fertilizer, while crops and some by-products, for example, remains of local wine production (maize or cassava), are used for animal feed. In the same sense, an evaluation of depreciation of assets would also hardly be accurate. Under such conditions, priority was given to the 'quick' acquisition of limited information relating specifically to our interests.

The values of agricultural products are calculated using the total volume of each production and farm-gate price. The farm-gate price of each commodity was determined as 1) selling price of the commodity should the household sell (or have sold before) the products, or 2) representing price of that commodity among the households surveyed in the communes (not mean price among them). In any case where no household in the commune sold that commodity, the representing price in other communes surveyed or the local market price was used for calculation.

This report, for simplification, uses the term 'agricultural products' as the sum of farm products (annual and perennial crops), livestock, forestry products and fishery products. Distinctive explanations of the agricultural products are provided where necessary.

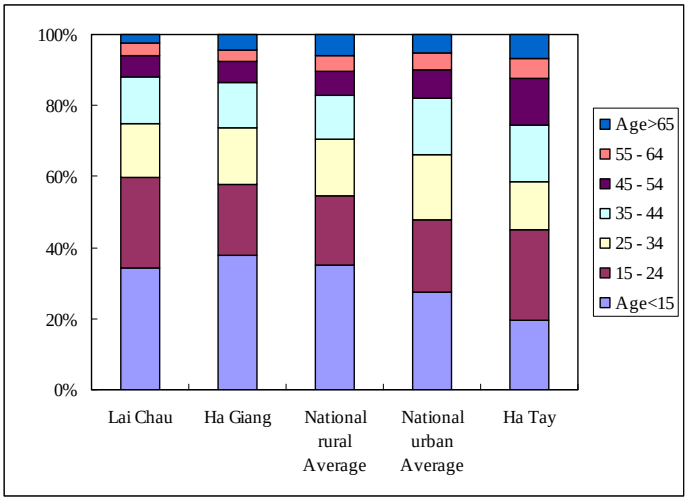
In this report, the '*cong*', is used as a proxy of labor-day. *Cong* is the Vietnamese term for the unit of labor participation on the farm, and is also used to calculate wages in some enterprises (especially in State Owned Enterprises). Measuring working time using this unit has disadvantages since it is a less accurate unit to measure actual time spent than 'labor-hour' which is used in the V(H)LSS surveys (and other household surveys in other countries). Some *congs* may be a whole day long while other *congs* may take only a couple of hours. However, many rural residents are so used to using *cong* as a working time unit that it could be assumed that, in order to measure total labor inputs, for example, during the rice transplanting period in one harvest season or in one year, using *cong* as a unit does provide the study with more accuracy than letting households count their total 'labor-hours'.

3. GENERAL INFORMATION ON THE SURVEYED HUOSEHOLDS

3.1 Household size and education attainments

As can be seen in Figure 1, the ratios of children under 15 years old in the surveyed households (34.3 % in Lai Chau and 37.9 % in Ha Giang) are similar to the national rural average (34.9%). The age structure of researched households in Ha Tay seems more 'aged' than the national urban average. On the other hand, the average population size of the surveyed households in Lai Chau and Ha Giang are 5.43 and 5.23 respectively, much higher than the national rural average 4.49 and urban average 4.27 shown in the VHLSS 2002 results (GSO [2004b]). The average size of researched households in Ha Tay is 3.97. Many families in the mountainous regions surveyed have two generations or more of relatives living together.

Figure 1: Population by age of the researched households against national average



Note: National Average is based on the national census of 1999 (GSO [2001]).
Source: Author's calculations, GSO (2001).

Data on education attainment illustrates the difficulties of education in ethnic minority areas. Table 2 shows the percentage of highest level of education of adult population (age 15 and over) of the researched households. Among the adult population, those who have finished primary education account for only 28.3 % in Lai Chau and 36.6 % in Ha Giang. Moreover, 49.8 % of researched households in Lai Chau and 40.0 % of those in Ha Giang have no adults who have finished primary education. However, education attainments of children seem to have improved in Ha Giang where the ratio of primary school age children (age 6-10) who do not attend school, i.e. children who have yet to enroll or have dropped-out, is 6.1 % , while in Lai Chau the figure is still as high as 31.5%.

Table2: Average education level of adult population of researched households

Unit: %

	Level of Education					
	No Education	Some Primary	Completed Primary	Completed lower secondary	Completed higher secondary+	Total
Lai Chau	43.9	27.8	15.8	10.9	1.5	100.0
Ha Giang	27.8	35.6	26.1	7.6	2.9	100.0
Ha Tay	5.3	8.1	31.7	24.2	30.7	100.0

Source: Author's calculations.

3.2 Land size

Average land sizes of the surveyed households are shown in Table 3. Households in mountainous regions possess more extensive agriculture and forest land than those in the Red River delta. High standard deviation of the forest land implies that there exists disparity among the households in the possession of forest land.

However, we must carefully assess the results, because many households in Lai Chau and Ha Giang provided the information on land size recorded on their land use certificates. During the interview surveys, we met many interviewees who 'did not know' the actual size of sawn areas of their crops. Some could infer the sawn land size from the amount of seeds or seedlings they planted. For example, in Ha Giang, some interviewed families described that 40kg of rice seedlings and 20kg of maize seeds are the standard amounts used in 1 hectare of agricultural land.

Table 3: Average land size of researched households

Unit: square meter

	Lai Chau	Ha Giang	Ha Tay
Agricultural land	10,023	6,867	1,651
	(8,715)	(5,917)	(855)
(Per capita)	1,855	1,291	425
	(1,458)	(952)	(230)
Annual crop land	6,523	6,681	1,649
	(5,474)	(5,886)	(831)
(Per capita)	1,202	1,250	415
	(932)	(935)	(231)
Forest land	14,779	19,109	0
	(33,053)	(37,194)	(0)
(Per capita)	1,096	2,978	0
	(3,037)	(6,544)	(0)

Note: Figures in parentheses are standard deviations.
Source: Author's calculations.

3.3 Income sources

Needless to say, the main income is from agricultural production. The staple crop is rice, except in one commune in Ha Giang, namely Can Ty commune, where only 16.3% of the researched households can produce rice due to poor land fertility and a lack of water resources. In another two communes in Ha Giang, 97.7% of the households produce rice.

Families who cannot produce rice eat ground maize (97.4% of households can produce maize in Ha Giang) or buy rice with cash (or in exchange for agricultural labor). In Lai Chau, almost all (207 out of 209) surveyed households can produce rice, and maize (93.8% of households produce) is used mainly for animal feed and wine production.

Rice production means vary from place to place. In one commune (Thuan Hoa) of Ha Giang, all surveyed rice-growing households produce two harvests a year, and farmers grow only one harvest in the other two communes. In Lai Chau, on the other hand, even within one commune there are a mixture of households producing either one or two harvests. Crop production, in many cases, is combined with animal husbandry. 97.1% of surveyed households in Lai Chau and 90.9% in Ha Giang raise livestock either for self-consumption or for sales.

Table 4 shows the average income from agricultural production (annual and perennial crops, livestock, and forestry- and- fishery). This data indicates more self-consumption of agricultural production in the two provinces compared with Ha Tay. However, the data also implies the existence of livestock markets even in the remote mountainous regions; cash income from livestock greatly exceeds that of annual and perennial crops.

Table 4: Average income from agricultural production of researched households

Unit: VND

		Lai Chau	Ha Giang	Ha Tay
a)	Annual and perennial crop production value	6,549,685 (4,582,738)	4,279,463 (2,856,420)	3,631,812 (2,305,923)
b)	Annual and perennial crops sold	1,977,287 (2,964,649)	309,748 (731,871)	1,653,778 (1,602,485)
c)	Commercialized rate (b/a)	30.2%	7.2%	45.5%
d)	Livestock production value	4,934,526 (5,274,309)	2,899,106 (2,856,701)	2,893,050 (3,342,179)
e)	Livestock sold	2,814,656 (4,039,899)	2,314,252 (2,660,282)	2,813,842 (3,160,390)
f)	Commercialized rate (e/d)	57.0%	79.8%	97.3%
g)	Forestry and fishery production value	2,294,164 (2,352,305)	1,479,087 (1,827,379)	100,990 (518,748)
h)	Forestry- and fishery products sold	612,179 (1,503,461)	292,109 (959,662)	100,990 (518,748)
i)	Commercialized rate (h/g)	26.7%	19.7%	100.0%

Note: Figures in parentheses are standard deviations.
Source: Author's calculations.

3.4 Income disparity

Table 5 shows the average cash income level of the households of the two mountainous provinces as below half of those in Ha Tay. It also implies low availability of non-agricultural labor markets in these mountainous areas. The average cash income from the agricultural products of the surveyed households in the two provinces exceeds that of non-agricultural income (their main income source is livestock). The portion of non-agricultural cash income of total income is as minimal as 22.2% in Lai Chau and 37.6% in Ha Giang (60.4% in Ha Tay on the other hand). High standard deviations of non-agricultural income and total income in the two mountainous provinces indicate the existence of a wide income disparity between the rich and the poor.

Table5: Average cash income of researched households

Unit: VND

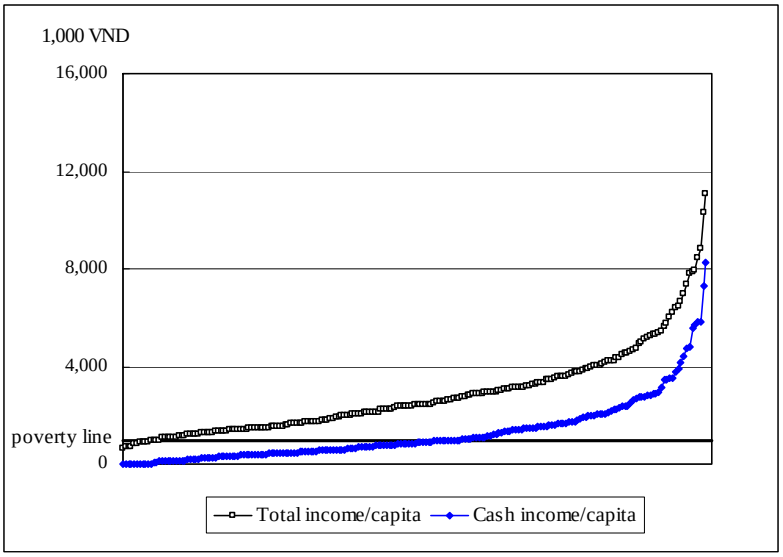
	Lai Chau	Ha Giang	Ha Tay
From agricultural production	5,404,122	2,916,109	4,568,610
	(7,100,485)	(3,143,961)	(3,627,570)
% of total cash income	77.8%	62.4%	29.6%
Non-agricultural cash income			
Employment wage	1,222,804	837,678	2,583,960
	(2,658,582)	(2,677,193)	(4,127,922)
Self-employment	143,541	506,283	6,800,990
	(859,824)	(1,512,728)	(7,524,168)
Social security	173,244	414,122	998,178
	(973,434)	(2,045,834)	(2,755,879)
Remittance	2,392	0	462,376
	(34,586)	(0)	(1,931,572)
Other cash income	0	391	0
	(0)	(5,934)	(0)
Total cash income	6,946,103	4,674,583	15,414,115
	(8,487,250)	(5,606,430)	(9,096,670)

Note: Figures in parentheses are standard deviations.
Source: Author's calculations.

In Figures 2 and 3, data on per capita total income and cash income per year are placed from poorest to richest (from left to right). In Vietnam, poor households are identified, by the definition of MOLISA, according to per capita income (not expenditure) of the household. Hence, from these two Figures, we can evaluate the poverty levels and disparities of poverty among the surveyed households. The thickened horizontal lines in the Figures are MOLISA's poverty line of mountainous rural areas defined in 2001

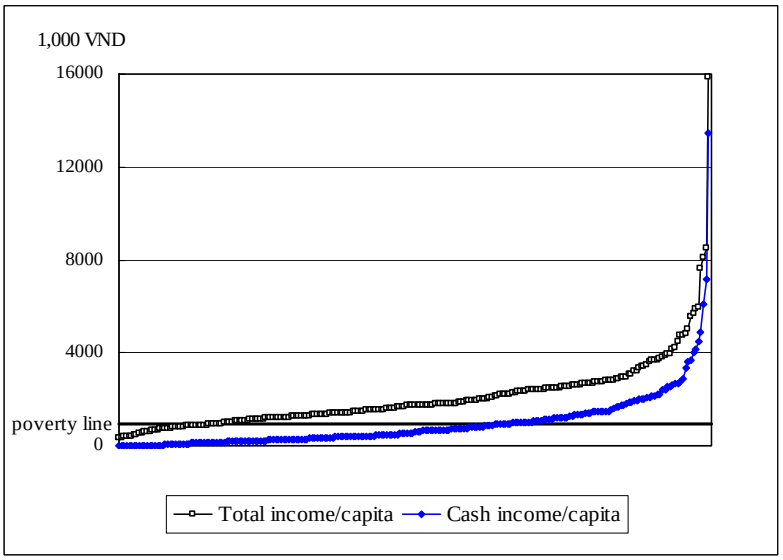
(80,000 VND per month). We can evaluate this as egalitarian composition of the income disparity, except for a few very rich households in the communes.

Figure 2: Distribution of income and cash income per capita of researched households in Lai Chau



Source: Author's calculations.

Figure 3: Distribution of income and cash income per capita of researched households in Ha Giang



Source: Author's calculations.

3.5 Labor allocation

Table 6 shows the average working time (congs) per year. The figures on working time per head of working age (age 15-60) at the farm (to grow annual and perennial crops) and for livestock husbandry are much higher in the two mountainous provinces. In the two mountainous provinces, each adult spends, on average, half a year in the fields. The working time presented here includes that for labor exchange with other households. In the researched sites of both provinces, labor exchange is customary, especially during the transplanting of rice, the planting of maize and the harvesting of both. Households that receive labor assistance must usually return the same number of congs to the households that provide labor. However, some households hire agricultural labor for rice growing. They are richer families that have larger and more numerous plots of rice fields and exchanges of labor are not enough to transplant and harvest rice within a suitable period of time during busy seasons[6]

On the other hand, in the researched households in Ha Tay, the average working time per head for crop cultivation (dominantly rice production) is almost equivalent to 1.5 months. This figure is somewhat biased, as some portion of the work age population (for example, students) are not engaged in agricultural work. The average working time among the adult population who actually participate in agricultural work is 73.7 *congs* a year. In the researched commune in Ha Tay, farmers commission local (hamlet level) agricultural cooperatives to organize land preparation, spraying and water management, and the cooperatives set the agricultural calendar and provide farmers with instruction as to the dates of transplanting and harvesting. Cooperatives within the district coordinate the common agricultural calendar of the district, so that work in each commune does not overlap. Hence, agricultural labor is readily available from neighboring communes. The households that require agricultural labor can recruit labor easily on the main road in the early morning. If farmers want to earn cash income in this way, they simply go to other communes when farmers are in need of labor.

Knowing the labor situation of the working age population alone is not enough to grasp the actual labor situation in the mountain areas because children are quite an important source of labor for many households. On average, 76.5 *congs* in Lai Chau and 85.0 *congs* in Ha Gaing of child labor per household are required each year for economic

[6] It is probably for the same reason that some smaller and poorer households plant rice directly in the field. Direct sowing of rice seeds is much more labor saving, although yield is generally lower.

activities. Among the important roles children bear are animal (especially buffalo) rearing, and participation in the planting, transplanting, and harvesting of rice and maize.

Table 6: Average working time of researched households

Unit: *Congs* (=labor-day)

	Lai Chau	Ha Giang	Ha Tay
Working age labor per head at field	198.6	181.5	46.3
	(115.4)	(127.7)	(41.8)
Working age labor per head for livestock	95.5	151.6	30.6
	(70.5)	(90.5)	(56.7)
Working age labor per head for non-agricultural income earning	25.2	30.6	174.6
	(41.2)	(59.3)	(113.2)
Child labor at field	31.7	17.8	0.0
	(97.4)	(41.2)	(0.0)
Child labor for livestock	43.9	64.8	0.0
	(83.6)	(152.3)	(0.0)
Child labor for non- agricultural income earning	0.8	2.4	5.0
	(7.2)	(22.0)	(40.9)

Note: Figures in parentheses are standard deviations.

Source: Author's calculations.

4. MARKETIZATION AND INCOME STRUCTURES

4.1 Income diversification and 'marketization' of livelihoods

From this Section, we aim to evaluate the degree of 'marketization' of livelihoods at the household level in the researched communes. We must start with the definition of 'marketized' livelihoods. One might assume that in rural villages a 'marketized' household can earn its income not only from rice production but also from various commodities and non-agricultural income sources. However, such a 'diversified' structure of income sources does not always equal a more 'marketized' livelihood.

Citing various studies on South Asia, Southeast Asia and Africa, the International Food Policy Research Institute (IFPRI) [2003] determines the definitions of 'diversification' in three ways. Firstly diversification is referred to as an increase in the number of income sources and balance among the different sources (diversity in source of income). This strategy can be seen in those rural households that aim to reduce the risks of production and income fluctuation, and satisfy their diverse food consumption needs.

The second definition concerns the switch from subsistence to commercial agricultural production (agricultural commercialization). The third definition of diversification is switching from low-value crops to high-value crops, or to non-agricultural economic activities (shift to high-value activities). Following this argument, we can define the high level of diversification in the second and third types as indicative of more 'marketized' rural households.

The above IFPRI study concludes that, when comparing 5 income quintiles in the Northern Uplands region of Vietnam, poorer households increase their level of diversification of the first definition in order to reduce risks and satisfy their diverse food consumption needs. The same study also notes that, when comparing the data of V(H)LSS in 1992, 1998 and 2002, there was a tendency towards commercialization and a shift towards high-value activities within this period, and that the richer are becoming more commercialized and relying more on non-agricultural activities for their income.

4.2 Calculation

We divided the sample households into 10 income categories, and examined 1) levels of diversity in risk aversion, 2) levels of commercialization, and 3) levels of shift to high-value activities in each category. In order to measure levels of risk aversion in income diversity, we use the Simpson Index of Diversity (SID). The SID is the application of a theory in biology to measure the bio-diversity of an eco-system. The SID in biology is defined as:

$$SID = 1 - \sum_i P_i^2$$

where P_i is the proportion of the species i in an eco-system. The SID value always falls between 0 and 1, and a more diversified species tends toward a high figure. If there were two species, for example, an eco-system where each occupy 50 percent of total (SID=0.5) would be more stabilized than one where one species occupied 90 percent thus giving a SID value of 0.12. Measuring the levels of income diversification by using this index is to interpret P_i as the proportion of income source i. The higher the Simpson Index of Diversification of a household, the more balanced their income sources and the more risk aversive they can be (IFPRI [2003], 43-44).

The levels of commercialization (share of output that is sold) are explored at three degrees; commercialization of crops, of agricultural outputs (including livestock, forestry and fishery products), and share of cash income within total income. The levels of shift to high-value activities can be measured by comparing working time against different economic activities[7] We presume crop production gives the lowest return per labor day (thus low-value), followed by livestock rearing, forestry, and then by fishery which are of greater value. Finally, with non-agricultural income generating activities (wage labor and self-employment) being the highest-valued activities.

4.3 Our results

Table 7 shows the results of our calculations. We obtained many different results from those in IFPRI [2003]. This is not surprising because we focused on areas of poorer communes in the poor Northern Uplands region. The IFPRI study covers 14 provinces of the Northern Uplands with different socio-economic conditions, topographically high and low lands, ethnic peoples-dominated areas and Kinh dominated areas, or rural and urban (including bigger cities such as Lao Cai and Yen Bai). Households researched in our study may predominantly fall into one or two of the five quintiles in the IFPRI study, and the communes researched would be categorized simply as 'rural' in the IFPRI study, as with other rural communes in lowland provinces.

Table 7: Levels of income diversification of researched households

1) diversity in source of income		
Income category	Number of income sources	SID
Poorest	6.86	0.50
2	9.23	0.56
3	9.98	0.58
4	10.61	0.58
5	9.68	0.58
6	12.23	0.61
7	11.20	0.61
8	12.48	0.61
9	13.86	0.60
Richest	15.86	0.62

[7] The IFPRI study compares the percentage of households participating in different activities, since the data on labor hours at the crop level is not available in the V(H)LSS data.

Table 7 (cont.)

2) commercialization

Income category	Share of output that is sold (percent)		
	Crops	agricultural output	total income
Poorest	5.2	14.2	21.3
2	4.1	18.0	24.8
3	5.7	19.4	29.7
4	8.7	25.7	32.0
5	9.1	29.5	33.7
6	11.8	28.4	36.4
7	17.6	36.3	42.7
8	19.2	37.4	45.4
9	20.4	39.0	46.9
Richest	31.8	48.3	59.4

3) shift to high-value activities

Income category	Labour time per work age population (*congs*)				
	crops	livestock	Forestry	fishery	Non-agricultural
Poorest	186.0	159.4	20.4	1.0	7.0
2	205.4	170.0	27.9	2.1	12.9
3	197.6	148.3	30.0	9.1	13.7
4	219.1	138.5	21.6	2.1	31.1
5	174.1	176.2	17.7	3.1	17.7
6	200.8	157.9	22.8	9.4	29.3
7	234.2	169.0	32.2	3.8	28.6
8	217.3	148.4	28.9	11.6	46.2
9	207.8	150.8	23.2	13.3	35.9
Richest	217.0	135.1	26.4	34.6	66.0

Note: 'Work age' is between 15 and 60 yrs.
Source: Author's estimates.

The first observation of our results is that the number of income sources is higher in the richest category. But if we look more carefully at the data, we find no household manages more than 25 income sources. This could be due to the fact that growing too many different commodities or allocating the available labor to too many types of activities is inefficient for the household.

We estimated SID values from our data, classifying income sources into those from rice, maize, other crops, livestock, forestry, fishery, wages, self-employment, social security, remittance, and other sources. Our results indicate, contrary to the IFPRI study, that the poorer households do not have higher SID values. As can be seen in the second

column of the first set of data in Table 7, there is no clear-cut negative trend between income increase and reduction of SID values. On the contrary, it is some poorer households that do not diversify their production in a risk aversive manner. These results may be interpreted to mean that in these mountainous rural communes, people still live without an effective means to reduce the risks of production failure and income fluctuation in advance. Or, it is a possible interpretation that those people live with post-damage measures against risk, i.e. support of foodstuff, cash or other in kind from neighbors and relatives or from local authorities being enough to mitigate damage due to lean production or low income[8].

Our results agree with those of the IFPRI study in that the richer households commercialize their production more than the poorer. Furthermore, the richer households spend more working time on higher-value economic activities[9]. However, both results on commercialization and shift to higher-value activities show that only the richest household group scores predominantly good results. It is also important to note that working times spent on crop production do not differ remarkably between rich and poor, but working time spent on fishery and non-agricultural work are much higher among the richest households. The richer households may allocate almost the same period of working time on the production of subsistence crops and cast additional working time on higher-value activities, which the poorer do not (or cannot).

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8 It was interesting for the author to learn the way rural people answer to the questions about the sufficiency of their crop production. In rural households (including those in Ha Tay province), when the production of staple crops in the previous year was not sufficient, their typical answers were ‘insufficient for --- months’. Thus meaning, contrary to the findings of some poverty studies on the South Asian countries, poor households do not reduce their (already low) consumption level. In fact, when asked what they so in times of hardship, the rural poor usually answered that they ask for support from relatives, rely on direct support of rice or maize from local authorities, or sell their large-size livestock (such as buffaloes).

9 The data on working time to forestry may not be reliable. The significant difference can be seen between the data of the households with registered forest land and those without forest land. The tendency is that many of households without registered forest land do not list the working time to firewood collection (although most of them collect 1-2 tons of firewood a year). They usually collect the firewood from “public” (non-registered) forest, and do not count firewood collection as an economic activity.

5. WHO ARE THE 'MARKETIZED' HOUSEHOLDS?

5.1 Income structures and household characters

This Section tries to seek relationships between the levels of 'marketization' of livelihoods (more commercialized agricultural production and more non-agricultural cash income in household income) of the surveyed households, and their socio-economic characteristics. There has been some literature, based on the VLSS survey data, showing relationships between household characteristics (not only endowed assets for production but also social conditions), and income structures. Van de Walle and Cratty [2003], for example, reveals evidence that characteristics of the households are associated with the degree of opportunity to participate in non-agricultural economic activities, and therefore, raise their welfare level. It argues that households having a household head with higher education attainments and belonging to the majority ethnic group are better positioned to take on market activities, and can therefore, raise their living standard. IFPRI [2003] similarly observes that, in the Northern Uplands region of Vietnam, the share of income from higher-value sources (livestock, forestry, aquaculture, wage etc.) is associated with household as well as commune characteristics. Of note is that the features of households that are associated with higher shares of each income source are different. For example, the age of household head has statistically significant correlations with the household's wage income, while it is ethnicity that has significant impact on the income share from livestock.

Van de Walle [2000] discusses the fact that households with poorly educated household heads obtain lower returns on irrigation investment, and therefore income from crop is lowered. On the other hand, Gallup [2002] argues that an individual's attributes, not a household's, are becoming more important factors to determine wage income levels. It concludes that the rate of return of education on wage level in Vietnam is improving (2.9% in 1993 and 5.0% in 1998), although still lower compared to the average rate of return in Asian countries (11%). 'Experience', calculated by the years of work after the completion of schooling, is strongly positively correlated with wages. The wage levels of women and non-ethnic Kinh have also improved between the 1992 and 1998 studies.

5.2 Model settings and results

Our hypothesis is that the levels of 'marketization' of a household, inferred from the higher share of commercialized income and participation in more high-value activities,

can be explained as a function of a household's socio-economic characteristics. Applying the models of the above studies, especially that of van de Walle and Catty [2002], we can assume that participation in each economic activity depends on household characteristics and community characteristics as:

$$d_i = \beta_0 + \beta_1 X_i + u_i^d$$

where dependent variable d_i is the measure of structure of income and labor allocation of household i, with the independent variable of a vector of household characteristics X_i. β_0 and β_1 are estimates of each variable, and u_i^d is the error term ($Eu_i^d = 0$, $\text{var}(u_i^d)$ constant).

Following the discussions in Section 4, we use five indicators of dependent variables; number of income sources, SID value, share of outputs sold within agricultural products, share of cash income within total income, and share of working time for non-crop agricultural production and for non-agricultural economic activities within total working time for economic activities. Instead of using labor hours, we use *congs* as the unit of working time (see Section 2).

Variable X_i includes some socio-economic characteristics such as ethnicity (Kinh ethnicity: ETH_i =1), household population size ($HSIZE_i$), agricultural land size ($LAND_i$), household composition (share of children under 6 yrs: $CHILD0-5_i$, share of children between 6 and 14 yrs: $CHILD6-14_i$), education attainment (average schooling years of adult population: EDU_i, number of primary school age children who are not attending school: $NOSCH_i$), and a dummy variable whether the household is a target of social policies (*ho chinh sach xa hoi*) or has 'meritorious in revolution' (*ho co cong voi cach mang*) status (if applicable: $POLICY_i$ =1). The characteristics of household head, such as age ($AGEHEAD_i$), schooling years ($EDUHEAD_i$), gender (female household

head: $FEMALE_i$ = 1) are also included. An area dummy for the commune where the household is located (remote commune (= Ban Giang commune in Lai Chau and Thai An commune in Ha Giang): $AREA_i$ =1) is also included. Definitions of each variable are listed in Appendix II.

We also tested regression on household income with the same explanatory variables. Let the household income (log) be denoted y_i. Hence:

$$y_i = \alpha_0 + \alpha_1 X_i + u_i^y$$

where α_0 and α_1 are the estimates of variables. An OLS model is to estimate the observation on household income and number of income sources, while we use a Tobit censored model to explain SID value, share of cash income and share of working time (since there is possibility of zero value for some households).

The results of the estimates are presented in Annex III. The figures in the table present the estimated coefficients and those in Italics are the values of *t*-statistics.

5.3 Interpretation of results

Figures in the first column of the table indicate that the household income level is higher among the ethnic Kinh, and where household heads have a higher level of education attainment. Household income has positive relationship with household size, but negative with share of the number of the children. It seems reasonable result since the dependent valuable in this case is household income, not income per capita; households with more adult labor force can gain more income. Income poverty may be associated with the number of children. These results may support the conclusions of other literature.

Another characteristic that shows statistical significance is land size. This variable also has positive relations with levels of commodity commercialization. This result may be the indication of low productivity of agricultural land; agricultural production relies on the possibility of expanding agricultural land. However, as noted in Section 3, it is difficult to measure land productivities from our research because land sizes recorded in the questionnaires are not, in many cases, actual sown size of agricultural products but are the registered size on the land-use certificate. In this sense, the positive impact on the commercialization level of income and share of time for non-crop agricultural activities

might be explained from other aspects. Accessibility to land-use rights could be linked to socio-economic status in the communities; those rich who are in a good position to get access to products and employment markets have been entitled to use larger agricultural land[10]

The estimates on the number of income source and SID value specify clearly who manages risk aversive income structures and who does not (or cannot). Variables of household size and area dummy have positive impact both on the number of income source and SID value. This can be interpreted that households with a larger number of members, and those living in remote areas, tend to diversify their income source in a risk aversive manner. On the contrary, the value of land size has a positive effect on the number of income sources and negative on the SID value (although statistical significance is not satisfying). Along with the results of positive relations between land size and income level, these results may indicate that households endowed with accessibility to larger land have a higher share of income from diversified income sources with higher economic values. Results of positive and statistically significant figures on the levels of commercialization (share of commercialization of agricultural products and share of cash income within total household income) also support this explanation.

Being a female-headed household has a negative impact on income. Besides this, figures on coefficients of female-headed households on number of income sources and SID value are both negative. Female-headed households are not only poorer but vulnerable in their livelihoods, relying on fewer income sources.

It would be interesting to contrast the 'marketization' levels between Kinh and non-Kinh ethnic households. Ethnic Kinh households sell more agricultural products and earn more cash income from non-agricultural income sources, therefore, can be regarded as 'commercialized', whereas, non-Kinh ethnic households spend more time on non-crop agricultural production. This might imply ethnic peoples' inefficient agricultural production. Although still positive, the coefficient in Kinh ethnic group's share of working time for non-agricultural work does not show statistical significance. The reason may be that some non-Kinh ethnic households have the opportunity to gain access to paid works from local public works. Almost all of the local leadership posts and public service workers (such as post office workers, police, medical post staff, etc.) at the commune level are occupied by the non-Kinh ethnic groups (the exception being teachers). In fact, among the non-Kinh ethnic households that have non-agricultural cash income, 24.1 % of them are local civil servants or paid public service workers. In other words, major

[10] Most households interviewed during this research obtained land-use rights after year 2000.

opportunities for wage labor in the researched areas are somewhat related to the public service, and access to other higher-paid, more stable jobs and self-employment activities are limited. 'Benefits' (not salary)[11] from these jobs are still an important income source for the non-Kinh ethnic groups. The same situation may apply to the households who are regarded as target households for 'social policy' programs or with 'meritorious in revolution' status. Being a target household for such social welfare programs, supposedly disadvantaged groups in society, has positive impact on share of cash income.

It is obvious that education attainments affect income levels as well as the structure of income and labor allocation within households. The longer the education period of household heads, the more working time the households spare for non-agricultural work, and therefore the higher the level of cash income.

6. CONCLUSION

Even in remote mountainous villages, it would be difficult to find households that are completely self-sufficient. After nearly 20 years since the *Doi Moi* policy was adopted, the market economy has even intruded into rural villages. However, how much rural households are exposed to the influence of a market economy, and how much they benefit from a market economy varies from household to household. This report found certain patterns associated with the socio-economic conditions of households and communes.

We have obtained both similar and dissimilar results to other literature concerning household welfare in Vietnam. What is similar is that household income levels are associated with the marketization of livelihoods. It can be said that the rich are those who can benefit from adapting themselves to a 'marketized' way of life. However, if the results are examined carefully, we can see that, in mountainous rural poor areas of the Northern

[11] At the local level, those who are working for public administration, communist party, cooperatives and mass-organizations and paid workers for public services do not receive 'salaries'. What they receive is 'public benefits' (*luong cap* or *phu cap*). There is a possibility that the share of 'households that receive pension' (0.12) in van de Walle and Catty [2003] (p27) based upon the VLSS 1992 survey is mistakenly higher than in reality due to this wording problem. Our research observes that only few households receive direct social benefits for elderly and handicapped. 'Pension' (which could be an interpretation of '*luong cap*') might include these quasi 'salaries' at the local levels. If so, the conclusion of van de Walle and Catty [2003] must be changed. It concludes that a 'pension' recipient has a reduced probability of self-employment, because they are elderly or handicapped. However, 'pension' recipients may not be engaged in self- employment, because many of them already work for the civil service.

Uplands region, only the very rich 10 percent of the researched households have incredibly 'market-oriented' features. The portion of households that benefit from market intrusion is still limited. This feature might not have been recognized in the V(H)LL studies. Many V(H)LL studies analyze national-level patterns or differences among seven geographical regions, and do not focus on structures within a poor commune. Since our research is conducted extensively in poor mountainous communes only, the results and implications to be drawn are different.

The second observation to note is that socio-economic characteristics of households do affect ways of life. The results of our estimates from a simple theoretical model indicate that most disadvantaged group is female-headed households. Households with better accessibility to land-use rights, who are not (or do not need to be) risk aversive in their income structure, are amongst 'market-oriented' households. Non-Kinh ethnic households are engaged in less commercialized livelihoods, although some of these households can get access to paid public service works. As argued in many studies, the important role of education in commercialization and access to labor opportunities is strongly supported in our study.

The discussion to be raised would be on the roles of the Government in the structural changes of the economy towards 'marketized' development in remote mountainous regions. It would be difficult to expect accessibility to various markets to improve in the researched areas within a short time frame. On such presumptions, the local authorities are now playing a crucial role in providing not only employment opportunities but also mitigation measures towards production failure. Providing subsidized rice seeds, which most households utilize, also helps maintain the quality of rice produced by the poor. Moreover, various programs on poverty reduction (not only by local public administrative units but also by various mass-organizations such as the Fatherland Front and the Women's Union) are also conducted in the researched areas. All the researched communes have constructed basic infrastructure under Program 135, and have had credit programs for poor households (although access is limited). Moreover, non-Kinh ethnic households are entitled to free medical care, and free primary school education for their children.

These programs have helped to improve their livelihoods. However, further efforts would be necessary to enhance their capacity for self-reliance. Agricultural extension services and the construction of basic infrastructure would enhance their land productivity. Rural poor, especially ethnic minorities tend to live together and help one another. This would be the right strategy to obtain supplement labor for agricultural production and to mitigate damage due to production failure in given conditions. However, if their

production efficiency and reliance are improved, more working time can be saved for 'market-oriented' economic activities outside the communities. A targeted approach toward disadvantaged groups (non-Kinh and female-headed households) should not be limited to the prioritized subsidies, but be extended to technical and institutional support to enhance their agricultural production.

Moreover, it seems that the rural areas of the Northern Uplands regions are left behind regarding the Government's 'industrialization and modernization' policies. The answers of the interviewees during our interview surveys hinted that the 'market cycles' they deal with are within very limited areas. Farmers sell their agricultural products at nearby markets or to merchants who come from nearby markets. Links to external economic spheres are limited to certain commodities such as tea. Coordinated efforts among the local authorities at provincial, district, and commune levels to achieve activities such as the marketing of agricultural production, introduction and promotion of more commercial commodities, introduction to employment opportunities, establishing favorable conditions for investment (to industries such as food processing), etc., would be expected.

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Appendix I: Profiles of researched communes

Lai Chau Province (as of September 2004)

1. Ban Giang commune, Tam Duong District
2. Ho Thau commune, Tam Duong District
3. Khong Lao commune, Phong Tho District

Name of commune	Ban Giang	Ho Thau	Khong Lao
Number of households surveyed	**66**	**80**	**63**
Population	2,859	5,174	2,898
Rate of ethnic minority population	95%	90%	95.2%
Total number of households	541	764	590
Rate of poor households	24.0%	31,7%	25.8%
Total land area (ha)	3,598	7,600	3,500
Agricultural land area (ha)	730.5	525	638.85

Ha Giang Province (as of August 2004)

1. Thuan Hoa commune, Vi Xuyen District
2. Thai An commune, Quan Ba District
3. Can Ty commune, Quan Ba District

Name of commune	Thuan Hoa	Thai An	Can Ty
Number of households surveyed	**90**	**60**	**80**
Population	5,170	1,907	3,640
Rate of ethnic minority population	over 80%	98%	99%
Total number of households	981	343	673
Rate of poor households	15.9%	25.7%	25.0%
Total land area (ha)	10,950	4,892	4,623
Agricultural land area (ha)	532	402	359

Ha Tay Province (as of June 2004)

1. Dan Hoa commune, Thanh Oai District

Number of households surveyed	**101**
Population	8,015
Rate of ethnic minority population	0%
Total number of households	2,050
Rate of poor households	3.7%
Total land area (ha)	517
Agricultural land area (ha)	346

Appendix II: Variable definitions and summary data

Variable		Mean	Std Dev
ETH	Ethnic Kinh household head dummy	0.05	0.23
HSIZE	Household size	5.33	0.23
LAND	Agricultural land size (m^2)	1558.8	1250.7
EDU	Average years of education per adult (15+)	3.07	2.23
NOSCH	Number of primary school age (6-10) children who are not attending school	0.12	0.40
AGE0-5	Share of household members that are 5 years or younger	0.10	0.40
AGE6-14	Share of household members that are between 6 and 14 years	0.27	0.21
POLICY	Household with 'social policy' target or 'meritorious in revolution' status dummy	0.05	0.02
AGEHEAD	Age of household head	43.2	94.3
EDUHEAD	Years of education of household head	3.23	2.97
FEMALE	Female household head dummy	0.05	0.21
AREA	Remote commune dummy	0.28	0.45

Appendix III: Coefficients in regression models

Variables	Log household income	Number of income sources	SID	Share of output that is sold		Share of labor of work age population	
				agro-products	total income	non-crop ago-products	Non-agrcult. activities
ETH	.128**	.804	-.005	.131***	.128***	-.097*	.026
	(2.50)	*(1.09)*	*(-0.28)*	*(3.04)*	*(2.82)*	*(-1.90)*	*(0.40)*
HSIZE	.068***	.715***	.006***	.009	.002	-.002	-.001
	(10.08)	*(7.36)*	*(2.86)*	*(1.61)*	*(0.25)*	*(-0.37)*	*(-0.11)*
LAND	.000***	.001***	-5.35e-06	.000***	.000**	-.000*	-.000
	(9.29)	*(7.31)*	*(-1.63)*	*(4.91)*	*(2.29)*	*(-1.73)*	*(-1.34)*
EDU	-.003	0.043	.004	-.000	-.008	-.003	-.006
	(-0.39)	*(0.41)*	*(1.45)*	*(-0.05)*	*(-1.22)*	*(-0.38)*	*(-0.57)*
NOSCH	.040	1.411***	.008	-.031	-.026	-.032	0.037
	(1.32)	*(3.21)*	*(0.85)*	*(-1.22)*	*(-0.95)*	*(-1.07)*	*(0.93)*
AGE0-5	-.292***	-.604	-.045	.033	-.006	.023	-.098
	(-3.38)	*(-0.49)*	*(-1.57)*	*(0.45)*	*(-0.07)*	*(0.27)*	*(-0.83)*
AGE6-14	-.130**	-1.141	0.011	.002	-0.98*	.054	-.085
	(-2.08)	*(-1.27)*	*(0.53)*	*(0.03)*	*(-1.76)*	*(0.88)*	*(-1.00)*
POLICY	.065	.0561	-.007	-.007	.085*	-.036	-.041
	(1.26)	*(0.08)*	*(-0.40)*	*(-0.16)*	*(1.84)*	*(-0.70)*	*(-0.59)*
AGEHEAD	.000	-.0001	.000*	-.000	.000	.000	.000
	(0.91)	*(-0.02)*	*(1.95)*	*(-0.20)*	*(0.98)*	*(0.86)*	*(0.99)*
EDUHEAD	.023***	.886	-.000	.005	.017**	.007	.020***
	(4.41)	*(1.17)*	*(-0.16)*	*(1.17)*	*(3.56)*	*(1.35)*	*(3.00)*
FEMALE	-.104*	-1.332*	-.043**	-.071	-.032	.047	-.056
	(-1.86)	*(-1.65)*	*(-2.33)*	*(-1.47)*	*(-0.03)*	*(0.85)*	*(-0.72)*
AREA	-.030	1.293***	.056***	-.009	-.001	.058	.035
	(-1.09)	*(3.24)*	*(6.14)*	*(-0.37)*	*(-0.03)*	*(2.10)*	*(0.94)*
Constant	6.486***	5.155***	.652***	.157***	.315***	.430***	-.033
	(123.22)	*(6.81)*	*(37.74)*	*(3.53)*	*(6.70)*	*(8.18)*	*(-0.45)*
Adj. R^2	0.396	0.306					
Obs.	439	439	439	439	439	439	439

Note: Figures in parentheses are values of *t*-statistics.
*** significant at the 1% level, **at 5% level, * at 10% level

Source: Author's estimates.