



**SEATCA**  
SOUTHEAST ASIA TOBACCO CONTROL ALLIANCE

**The Collaborative Funding Program for  
Southeast Asia Tobacco Control Research**

**IMPACT OF TOBACCO  
GROWING ON THE  
LIVELIHOOD AND HEALTH  
OF TOBACCO FARMERS AND  
THE ENVIRONMENT: A  
PRELIMINARY STUDY  
IN VIETNAM**

**Nguyen Thanh Huong  
Hoang Van Minh  
Kim Bao Giang  
Nguyen Tuan Lam**

**Financial support from  
The Rockefeller Foundation and  
Thai Health Promotion Foundation**

**IMPACT OF TOBACCO GROWING ON THE LIVELIHOOD AND  
HEALTH OF TOBACCO FARMERS AND THE ENVIRONMENT: A  
PRELIMINARY STUDY IN VIETNAM**

by

**Nguyen Thanh Huong, Hanoi School of Public Health,  
Hoang Van Minh, Hanoi Medical University  
Kim Bao Giang, Hanoi Medical University**  
Hanoi, Vietnam

Advisor

**Nguyen Tuan Lam, WHO Vietnam**

Editor

**Menchi G. Velasco**

Supported by

**Southeast Asia Tobacco Control Alliance (SEATCA)  
Under The Collaborative Funding Program for Tobacco Control Research**

Financial support from

**The Rockefeller Foundation and  
Thai Health Promotion Foundation (ThaiHealth)**

**March 2009**

## **ACKNOWLEDGEMENTS**

We would like to express our sincere thanks to The Rockefeller Foundation, Thai Health Promotion Foundation (ThaiHealth) and the Southeast Asia Tobacco Control Alliance (SEATCA) for their technical and financial support, without which this report could have not been possible.

Thanks also go to the research teams at the Hanoi School of Public Health, Hanoi Medical University, Vietnam Public Health Association and Thai Nguyen Medical University for their contributions to various stages of the study process.

We also would like to extend our special thanks to Ms Menchi G. Velasco from SEATCA, Prof. Teh-wei Hu, Dr Nguyen Ngoc Bich, Ms Nguyen Thi Quy, and Mr Do Minh Son from the Vietnam Public Health Association for their technical support and special contributions to the study.

We wish to also acknowledge the anonymous respondents in the four communes who voluntarily participated in this study, without whom this study would have not been done.

## TABLE OF CONTENTS

<b>ACKNOWLEDGEMENTS .....</b>	<b>1</b>
<b>TABLE OF CONTENTS .....</b>	<b>3</b>
<b>LIST OF TABLES .....</b>	<b>5</b>
<b>LIST OF FIGURES .....</b>	<b>6</b>
<b>ABBREVIATIONS .....</b>	<b>7</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>8</b>
<b>INTRODUCTION.....</b>	<b>11</b>
<b>STUDY OBJECTIVES.....</b>	<b>13</b>
<b>1. General Objective.....</b>	<b>13</b>
<b>2. Specific Objectives.....</b>	<b>13</b>
<b>METHODOLOGY .....</b>	<b>14</b>
<b>1. Study Design .....</b>	<b>14</b>
<b>2. Study Sites.....</b>	<b>14</b>
<b>3. Study Participants .....</b>	<b>16</b>
<b>4. Sampling Method and Sample Size .....</b>	<b>17</b>
<b>5. Data Collection .....</b>	<b>18</b>
<b>6. Data Management and Analysis .....</b>	<b>18</b>
<b>7. Human Subjects.....</b>	<b>19</b>
<b>STUDY RESULTS.....</b>	<b>20</b>
<b>1. General Description of the Study Sample.....</b>	<b>20</b>
<b>2. The Livelihood of the Tobacco Farmers in Vietnam .....</b>	<b>22</b>
<b>3. Pesticide and Fertilizers Used in Tobacco Farming.....</b>	<b>34</b>
<b>4. The Association Between Tobacco Farming and Self-reported Illness.....</b>	<b>36</b>
<b>5. The Roles of Child and Woman Labor in Tobacco Farming.....</b>	<b>39</b>

<b>DISCUSSIONS AND RECOMMENDATIONS .....</b>	<b>42</b>
<b>REFERENCES.....</b>	<b>47</b>
<b>APPENDICES.....</b>	<b>49</b>

## LIST OF TABLES

Table 1: Characteristics of studied households.....	20
Table 2: Characteristics of studied household members.....	21
Table 3: Planting area owned by each household in 2006 (sq. mt.) .....	22
Table 4: Total area used by a household for tobacco cultivation in 2006 (sq. mt.).....	23
Table 5: Average annual income per household in different communes (VND) .....	23
Table 6: Annual household expenditure on tobacco and corresponding revenue by proportion of land used for tobacco growing ( <i>personnel costs included, VND</i> ) .....	31
Table 7: Self-reported illness during the last six months.....	36
Table 8: Mean and standard deviation of self-reported illness scale by groups of farmers .....	38
Table 9: Results of multiple linear regression analysis of the association between level of tobacco farming involvement and illness .....	39

## LIST OF FIGURES

Figure 1: Process of selecting study sample .....	15
Figure 2: Proportion of poor household in different communes in 2006 .....	24
Figure 3: Revenue from tobacco farming vs. revenue from other sources.....	24
Figure 4: Reasons for planting tobacco .....	25
Figure 5: Agencies/persons who requested planting tobacco .....	26
Figure 6: Supports from tobacco companies to farmers .....	27
Figure 7: Market place for tobacco products .....	28
Figure 8: Decision on the price of tobacco .....	28
Figure 9: Annual household expenditure on tobacco and corresponding revenue ( <i>personnel costs not included, VND</i> ) .....	30
Figure 10: Annual household expenditure on tobacco and corresponding revenue ( <i>personnel costs included, VND</i> ) .....	31
Figure 11: Expenditure on 1000 sq. mt. of different crops ( <i>personnel costs included</i> ) ....	32
Figure 12: Indebted because of tobacco farming .....	33
Figure 13: Satisfaction about tobacco growing .....	34
Figure 14: Main sources of energy for curing tobacco .....	35
Figure 15: Sources of woods for curing tobacco .....	35

## ABBREVIATIONS

CI	Confidence Interval
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GTS	Green Tobacco Sickness
HSPH	Hanoi School of Public Health
HMU	Hanoi Medical University
IDI	In-depth Interview
SD	Standard Deviation
VND	Vietnam Dong
VPHA	Vietnam Public Health Association
WHO	World Health Organization



## EXECUTIVE SUMMARY

In order to enforce the policies on tobacco control in Vietnam, reliable information on health and socio-economic hazards associated with tobacco farming are urgently needed. This study was among the first of its kind to be conducted in Vietnam to preliminarily investigate the impacts of tobacco growing on the livelihood and health of tobacco farmers, as well as the environment in Vietnam. The study contributed primary results to meet the urgent need for sound evidence in this area not only in Vietnam but also in the region.

### Methods

A mixed-methods design including qualitative method (in-depth interview and focus group discussion) and cross-sectional household survey was employed. Two districts including Vo Nhai district in Thai Nguyen province in the North and Cam My district in Dong Nai province in Southern part of Vietnam were purposely selected. Two communes, one a tobacco farming area and another, a non-tobacco farming area which shared similar geographical and socio-economical characteristics, in each selected district were chosen. for a total of 4 communes for this study. In total, 960 farmers aged 16-60 years from 480 households were recruited for the quantitative survey. For the qualitative part of the study, 8 in-depth interviews and 8 focus group discussions (FGDs) were conducted.

Stata 8 software was used for both descriptive and analytical statistics. Qualitative data analysis was done thematically using open coding.

### Results

In the South, the average annual income per household in the tobacco-farming commune was higher than that in the non tobacco-farming commune. However, in the North, households in the tobacco-farming commune had lower income than those in the non-tobacco-farming commune. Similarly, the proportion of poor households, as classified by the local authorities (based on per capita income and area of land the household possessed), was lower in the Southern tobacco-farming commune compared to the non-tobacco farming commune in the region, whereas in the North, the proportion of poor households in the tobacco-farming commune was higher than those in the non-tobacco-farming commune. In both of the tobacco-farming communes, tobacco farming was not the main source of household revenue (accounted only 36% and 47% of total household revenues in the tobacco-farming commune in the South and the North, respectively).

The main supports that tobacco farmers received from the requesters were fertilizers, seeds and technical support. However, the supports were very limited. The market place for tobacco product was reported to be uncertain. Most of the tobacco farmers said that they had to sell their tobacco products in the free market (72.1% in Xuan Dong and 99.2% in Lau Thuong). Many tobacco farmers and key informants including both

communes' leaders as well as heads of community health centers in the North and South referred to the instability of tobacco prices.

Although the majority of tobacco farmers in quantitative survey reported that tobacco prices were set by agreement between them and the buyers, the qualitative findings showed that tobacco farmers actually did not have real bargaining power and had experienced various pressures. Tobacco growing actually caused indebtedness for the tobacco farmers. About 17.2% of households in Xuan Dong and 30.2% of those in Lau Thuong were reported to be indebted because of last year's tobacco harvests. Therefore, only about half of the tobacco farmers reported that they were satisfied with tobacco growing.

Most of the tobacco farmers used coal or firewood in curing tobacco leaves with 75.0% of them reported that they took woods from the forest.

Regarding the health impacts of tobacco farming, the study found that tobacco farmers had significantly more illnesses than non-tobacco farmers ( $z = 6.67, p < .0001$ ). In the multiple linear regression model, we found that there was significant dose-response relationship between tobacco cultivation involvement and self-reported illness after controlling demographic variables. This suggested that the more farmers were involved in tobacco farming, the more illnesses were reported.

According to community informants and focus group discussions of farmers, the participation of children in tobacco production was a common practice in the life of the two communes in the study. Qualitative information also revealed that child labor was more common in tobacco farming than in other agricultural activity because tobacco cultivation was more labor intensive.

It is important to note that women are vital at almost all stages of tobacco farming. As explained in all the in-depth interviews and FGDs, most of the tobacco farming work was taken care of by women. Women not only have same role with their husbands of economic producers through their labor, but also have added weight of their roles as mothers - bearing children, child-rearing and household management.

## **Discussion and Recommendations**

This study generated a number of valuable findings surrounding tobacco farming, not only for improving knowledge of the socio-economic and health effects of tobacco growing but more importantly for providing sound evidence for dissemination to the general public and policy-makers at different levels in Vietnam.

1. The findings of this study indicated that tobacco farmers were not wealthier than the non-tobacco farmers. Tobacco farming commune in the North had lower income level and had more poor households. Tobacco growing was not the main source of household revenue (only accounted for 36% and 47% of total household revenues in the tobacco-farming commune in the South and the North, respectively). Tobacco even resulted in

indebtedness for the tobacco farmers. About 17.2% of households in Xuan Dong and 30.2% of those in Lau Thuong were reported to be indebted because of the previous year's tobacco harvests. The market place for tobacco product was not secured, with more than 85% of tobacco farmers having had to sell their tobacco products in the free market. Tobacco farmers did not have bargaining power and had experienced various pressures. This was contrary to what was divulged by the tobacco companies that "tobacco brings prosperity to its farmers".

2. Economic scale for tobacco cultivation was not very favorable in comparison with other crops. Market for tobacco leaves is not stable. As a result, tobacco had never been the main source of household revenues.

3. This study also found that the utilization of the labor of young children and women was a common practice in tobacco farms in Vietnam. This intensive involvement in tobacco work places children and women particularly vulnerable to tobacco hazards to health and demands urgent attention.

4. It was also apparent from this study that tobacco farmers had significantly more illnesses than non-tobacco farmers. The symptoms that commonly found among tobacco growers include tiredness/weakness, nausea, increased perspiration/ sweating, chill, increased salivation, poor appetite, itchy and rash. These findings again confirmed what was already reported on the health effects due to occupational exposure during tobacco cultivation in other countries.

5. Most of tobacco farmers used coal or firewood in curing tobacco and most of them took woods from the forest. This is actually a bad practice as it will lead to deforestation.

Vietnam is still in the early stage of the battle against tobacco. The findings from the present study provided valuable and timely evidence that could be used to increase public awareness as well as develop and implement appropriate responses to the harmful effects of tobacco growing. To be effective, several proposals were suggested and should be considered:

- Promote awareness about the harmful social, environmental and health effects of tobacco farming with the aim to influence local governments and the communities to support policy changes.
- Conduct broader and deeper studies on this issue using prospective approach to establish the long-term health and environmental effects of tobacco cultivation.
- Government should take initiatives and that alternatives should be explored to replace tobacco farming.

## INTRODUCTION

For decades, the tobacco industry, in search of even more profits, has been encouraging countries and farmers to grow more tobacco. They have been promoting tobacco growing as a panacea, claiming that it will bring unparalleled prosperity to farmers, their communities, and their countries (1).

Vietnam, a developing country with a tropical climate and hard-working laborers, which seemed appropriate for tobacco cultivation, was not outside the target of cigarette companies. The total area devoted to tobacco cultivation in Vietnam was about 18,000 hectares, accounting for 0.28% of total agricultural land in 2002, which gave an output of about 27,400 tons of tobacco per year (2). The tobacco industry has established a plan to gradually increase domestic tobacco leaf production toward the year 2010 through increased production area and improved yields (3).

Little is currently known about the employment generated by the tobacco industry or its potential to generate employment and income in agriculture, industry or sales. In 2000, there were an estimated 136,000 full-time workers involved in tobacco cultivation. Most employment related to tobacco growing would be created for unskilled agricultural labor in households. Tobacco cultivation was rarely the main source of income of the house. Average profits were around 21% to 31% only of total household revenues (3).

Processing of tobacco leaves has been mostly done directly by households or groups of households involved in tobacco cultivation. In a research mission to Soc Son district, tobacco planting households there estimated that 20 working days were needed for tobacco curing per hectare planted; including the time spent gathering woods for fuel. The major input into curing of tobacco were primarily coal and firewood. For every hectare of tobacco output, 5.25 tons of coal and 21 cubic meters of firewood were needed. In addition, for curing of tobacco, ovens would have to be built. This would require a workforce for the initial construction, and later for maintenance or rebuilding (3).

While the cigarette industry could not prove that tobacco farming was a mainstay of many countries' economy, the seriously damaging health and environmental impacts caused by tobacco farming have been evident by many publications worldwide. From the moment the tobacco seed was planted to the time the tobacco leaves were harvested and cured, the health of those who cultivated the crop was constantly put in peril (1, 2).

The hazards posed by tobacco cultivation place tobacco workers at increased risk of injury and illness. Children and adults, who are mainly women working in tobacco farms, frequently suffered from green tobacco sickness (GTS), which was caused by dermal absorption of nicotine from contact with wet tobacco leaves. GTS is characterized by symptoms that may include nausea, vomiting, weakness, headache, dizziness, abdominal cramps, and difficulty in breathing, as well as fluctuations in blood pressure and heart rates (4-6).

Large and frequent applications of pesticides to protect the plant from insects and diseases can cause a lot of damages to human such as poisonings, skin and eye irritation and other disorder of the nervous, respiratory systems as well as kidney damage (7, 8).

Tobacco growing also causes a lot of damages to the environment. In many developing countries firewood is used as fuel to cure tobacco leaves and to construct curing barns. An estimated 200,000 hectares of forests and woodlands are cut down each year because of tobacco farming (9). Environmental degradation is also caused by the tobacco plant, which leaches nutrients from the soil, as well as pollution from pesticides and fertilizers applied to tobacco fields (10).

In Vietnam, tobacco control has received recent attention. The Vietnamese Government's readiness to curb tobacco epidemic was well reflected in the Prime Minister's Decision No 77/2002/QĐ-TTg on Ratification of Program of Prevention and Control of Certain Non-communicable Diseases for the Period 2002–2010 (11) and the Government Resolution No 12/2000/NQ-CP on National Tobacco Control Policy 2000 – 2010 (12). Vietnam signed the WHO's Framework Convention on Tobacco Control (FCTC) on 8 August 2003 and ratified it on 17 December 2004.

In order to enforce the policies on tobacco control in Vietnam, reliable information on health and socio-economic hazards associated with tobacco farming are urgently needed. However, even though the number of research studies on tobacco in Vietnam has recently rapidly increased, to the best of our knowledge, there remains no research on this area. The high quality evidence on health and socio-economic hazards associated with tobacco farming is believed to be a firm background for the advocacy process against tobacco use in Vietnam. This study is among the first of its kind to be conducted in Vietnam. On the whole, the study contributes primary results to meet the urgent need for the sound evidence in this area not only in Vietnam but also in the region.

# **STUDY OBJECTIVES**

## **1. General Objective**

To preliminarily investigate the impacts of tobacco growing on the livelihood and health of tobacco farmers, and the environment in Vietnam.

## **2. Specific Objectives**

1. To describe the livelihood of the tobacco farmers in Vietnam.
2. To estimate the amount of pesticide and fertilizers used in tobacco farming.
3. To explore the association between tobacco farming and self-reported illness.
4. To describe the roles of children and woman labor in tobacco farming.

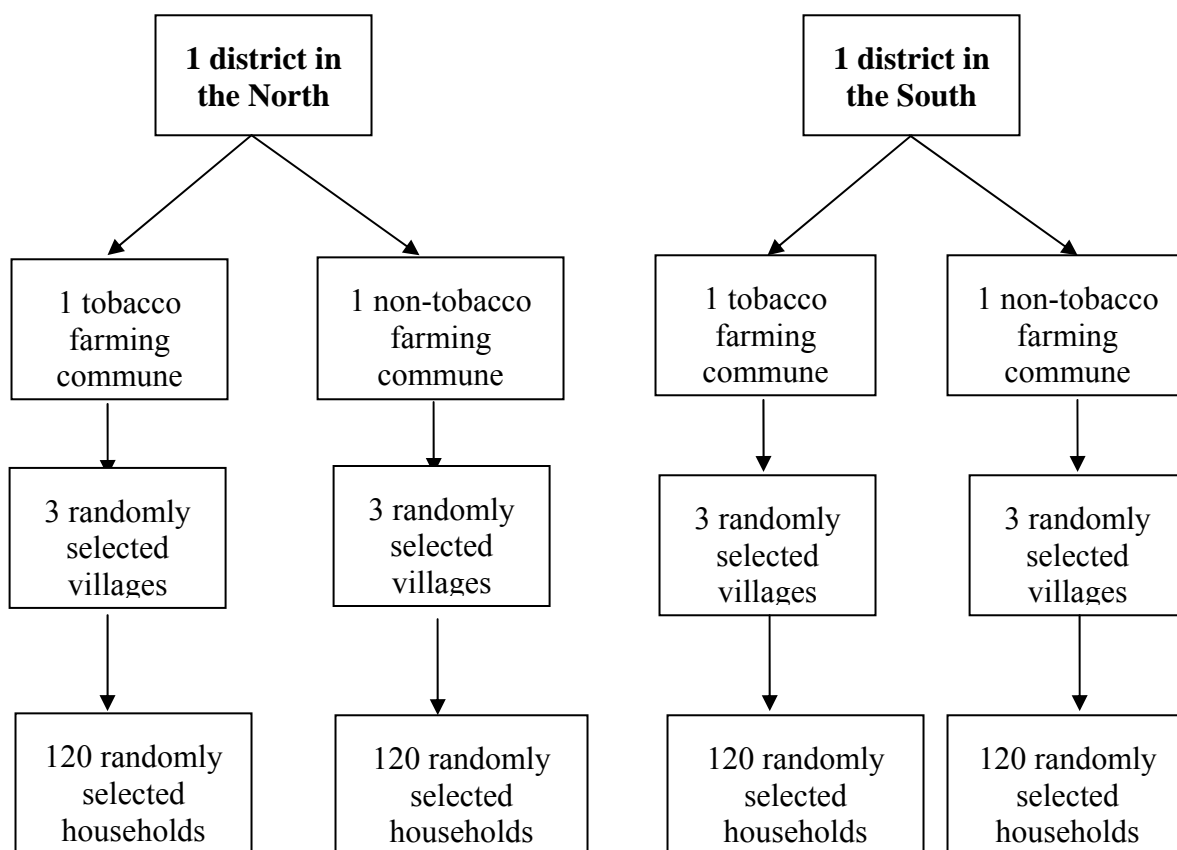
# METHODOLOGY

## 1. Study Design

A mixed-methods design (13) including qualitative method (in-depth interview and focus group discussion) and cross-sectional household survey was employed. Mixed-methods design allowed researchers to develop a more comprehensive understanding of the complexity of human behaviors and experiences. Incorporation of qualitative method in the present study added a cultural dimension to the impacts of tobacco farming on livelihood, health and the environment of the farmers.

## 2. Study Sites

Two districts including Vo Nhai district in Thai Nguyen province in the North and Cam My district in Dong Nai province in the Southern part of Vietnam were purposely selected (see map attached in Appendix 1) because of the feasibility of the project and the representativeness of tobacco farming in the two main parts of Vietnam. Two communes - one, a tobacco farming area and another non-tobacco farming area (for the purpose of comparison) - which have similar geographical and socio-economical characteristics, in each selected district were chosen for a total of 4 communes for the present study. In Vietnam, each commune includes about 8-10 villages. However, only 3 villages in each commune were randomly selected (see Figure 1) due to reasons of time and logistics involved in data collection.



**Figure 1: Process of selecting study sample**

**Vo Nhai:** Vo Nhai district is a rural area located in the North of Thai Nguyen province. The district has 14 communes and 1 town. The total population of Vo Nhai is about 63,000. Vo Nhai covers an area of 84,510.4 hectares, mainly highland and mountainous areas. Flat area for agricultural production is small, mainly along streams, rivers and valleys. Vo Nhai has about 29,703 agricultural labors, accounting for 47.43% of its population. Most of the population live in rural areas (about 90%), mainly producing agro-forestry products. The number of poor people in the year 2000 was 56%.

**Cam My:** Cam My district is a rural area located in the South of Dong Nai province in the South of Vietnam. The district has 13 communes and 1 town. The district shares border with Ba Ria-Vung Tau province in the South, Long Khanh town in the North, Long Thanh and Xuan Loc districts in the West and the East, respectively. The total population of Cam My is 156,217 people living in a total area of 46,823 hectares. Total land used for agricultural production is about 6,000 hectares, of which about 1,300 hectares were grown with tobacco in 2006-2007. There is one small tobacco factory in this district. However, it does not significantly contribute to the district's economic growth. Cam My has about 109,200 agricultural workers, that accounts for 66.96% of its



population. The number of poor households was 7.8% (2,458/31,152) in 2006. The mortality rate seemed to have slightly increased during the past several years (344 in 2005, 369 in 2006 and 203 in the first six months of 2007).

**Lau Thuong commune (tobacco growing):** Lau Thuong commune is located along the national road 1B. The commune covers an area of 400 hectares. It has 11 villages and a population of 6,170. In 2006, crude birth rate was 14.9%, crude mortality rate was 5.18% and infant mortality rate was 10.9%. The number of poor households in the commune was 36% in year 2000.

**Phu Thuong commune:** Lau Thuong commune shares its southern border with Lau Thuong commune. The commune covers an area of 544 hectares. It has 11 villages and a population of 4,655 people. In 2006, crude birth rate was 16.2%, crude mortality rate was 5.6% and infant mortality rate was 15.7%. The number of poor households in the commune was 37.7% in year 2000.

**Xuan Dong commune (tobacco growing):** Xuan Dong commune was established in 1986 with a population of 20,541 people divided into 3,816 households and living in an area of 5,003 square kilometers in 9 villages. Most of the people live in 3 villages, namely Suoi Luc, La Hoa and Be Bac, and belong to the minority group and have low educational levels. Xuan Dong has about 8,000 agricultural workers. Tobacco growing accounts for 355 hectares out of the 825 hectares used for agriculture in this commune. The GDP per capita of this commune is about US\$400. Its population growth rate is 1.34%. The commune's health center is trying to achieve the national standard in health care. In 2006, there were 12,380 medical check ups (0.62 time/person/year) conducted in the health center.

**Xuan Tay commune:** Xuan Tay commune is located in a mountainous area with the population of 21,049 people divided into 4,178 households and living in a total area of 5,279 square kilometers in 12 villages. The GDP per capita of this commune is about US\$400. Its population growth rate is 1.33%. In December 2006, there were 647 poor households accounting for 16.54% of the population. The commune's health center is trying to reach the national standard in health care. In 2006, there were 15,384 medical checkups (0.73 time/person/year) conducted in the health center.

### **3. Study Participants**

#### **3.1 Quantitative Survey**

A total of 968 farmers aged from 16 to 60 years were chosen from 480 randomly selected households, including a person who was head of the household or who knew best about the livelihood of the households (income, expenditure, farming etc.).

#### **3.2 Qualitative Study**

- *In-depth interview:* Four leaders and four heads of community health centers of four selected communes.

- *Focus group discussion (FGD)*: In each commune two FGDs were conducted, as a result, a total of 8 FGDs were implemented in this study. Each group included 8-10 farmers who had the best knowledge about the livelihood, environment and information related to farming activities of the community, and who were willing to participate. Purposive sampling permitted researchers to select the sample on the basis of their own judgment and knowledge of the population.

## 4. Sampling Method and Sample Size

### 4.1 Sampling Method

A two stage cluster sampling technique was employed (see Figure 1). Three villages from each chosen commune were randomly selected and then about 40 households in each village were randomly chosen. All farmers aged 16-60 in the selected households were interviewed. One key informant of the household answered all questions related to general information of the household. Then each farmer in the household responded to the question measuring their own self-reported illness.

### 4.2 Sample Size

#### 4.2.1 Quantitative Method

To determine the sample size for quantitative survey, the formula for comparison of 2 means (2-sided) was employed (14):

$$n=[A+B]^2 * 2 * SD^2 / DIFF^2$$

Where:

n: the sample size required in each group (double this for total samples)

SD: standard deviation of the primary outcome variable (self-reported illness measured as continuous variable): here 6 for conservative estimation.

DIFF: Expected size of deference: 3 points

A:1.96 (significant level 5%)

B: 1.64 (power 95%).

Design effect (using household as a cluster): 2

Estimated refusal rate: 15%

Sample size for each commune: 240 farmers.

Total samples of 4 communes: 960 farmers. It was estimated that each household has 2 farmers and 480 households (120 in each commune) were recruited for the quantitative survey.

#### **4.2.2 Qualitative Method**

Eight people were chosen for in-depth interviews and 8 FGDs with 8-10 people for each FGD (about 85 people in total participated in the qualitative study).

### **5. Data Collection**

#### **5.1 Quantitative Data**

Recruited and trained health workers and part-time staff from each commune were responsible for conducting interviews at selected households using structured questionnaire which was tested in both the Northern and Southern study sites and revised according to the results of the pretest (see Appendix 1). The qualitative data were collected under supervision of the research team from the Hanoi School of Public Health (HSPH), Hanoi Medical University (HMU) and Vietnam Public Health Association (VPHA). The field manual for collecting data was developed to provide practical information necessary to ensure that standard methods were used to collect data in all participating sites. About 5-10% of the questionnaires collected were checked by research team to ensure the quality of data.

#### **5.2 Qualitative Data**

Qualitative data were collected by experienced researchers from HSPH, HMU and VPHA based on the developed guidelines (see Appendix 2). In-depth interviews were conducted at the farmers' house in the village. Two researchers (one facilitator and one note taker) were responsible for conducting each FGDs. FGDs were conducted in community halls or in one household provided that all participants agreed to it.

### **6. Data Management and Analysis**

#### **6.1 Quantitative Study**

In order to ensure data integrity, the following steps were taken:

- A coding manual was developed for the survey.
- Two experienced researchers cleaned all the filled-up questionnaires for inconsistent responses and non-responses before conducting data entry.
- Steps were taken to ensure no duplication in ID numbers and all ID numbers were in the range.
- Data were entered into the software Epi-data by two experienced research assistants. Double entry verification was used on a random sample of 10% of the returned survey questionnaires.
- Frequency distributions of all variables were generated and checked for invalid response codes and the degree of missing data.
- Inconsistent responses were again checked with the original questionnaires.

- Both descriptive and analytical statistics were carried out using Stata 8 software. Descriptive indices of interest were provided as the proportion of the entire sample of respondents as well as for groups of interest, for example North/South; tobacco farming and non-tobacco farming, etc.
- Wilcoxon rank-sum (Mann-Whitney) test was used to explore the difference in total illness scores of tobacco growers and of other farmers. Multivariate linear regression modeling was performed to examine the association between self-reported illness and tobacco farming in the study populations while controlling method was used for confounding factors such as sex, age, economic status, etc. A significance level of  $p < 0.05$  was used.

## **6.2 Qualitative Data**

All in-depth interviews (8 interviews) and focus group discussions (8 FGDs) were taped and researchers also took notes. All taped interviews and FGDs were transcribed into Vietnamese for analysis.

Data analysis was done thematically using open coding, which is the process of breaking down, examining, comparing, and conceptualizing data (15) to identify common major themes and sub-themes. Thematic analysis was chosen as the analytic approach because the qualitative study stage in this project was exploratory, rather than being aimed at testing a particular hypothesis (16).

## **7. Human Subjects**

Ethical clearance for conducting this research was requested and granted by the HSPH's Institutional Review Board.

Before conducting data collection at the 4 communes, written approval from the People's Commune Committees was also requested. Before participating in this study, all invited respondents were provided with clear information regarding this research. They were informed that participation would be voluntary through informed consent. Their responses would be confidential, there would be no right or wrong answers, and they could stop or withdraw from participating at any time and refusal or withdrawal would not have any effect on them in any way.

## STUDY RESULTS

### 1. General Description of the Study Sample

In this study, 4 communes were selected, including 2 in the North (Lau Thuong and Phu Thuong, Vo Nhai district, Thai Nguyen province) and 2 in the South (Xuan Dong and Xuan Tay, Cam My district, Dong Nai province). A total of 480 households from 4 selected communes were surveyed. On average, each household had about 4.9 persons. The total number of household members within the studied households was 2,120 (Table 1).

**Table 1: Characteristics of studied households**

Commune	No. of households	Household size	No. of household members/(%)
	Number (%)	Mean (sd)	
<b>In the South</b>			
Xuan Dong	121 (25.2)	5.1 (1.5)	563 (26.6)
Xuan Tay	118 (24.6)	5.3 (1.3)	568 (26.8)
<b>In the North</b>			
Lau Thuong	120 (25.0)	4.8 (1.1)	502 (23.7)
Phu Thuong	121 (25.2)	4.7 (1.1)	487 (23.0)
<b>Total</b>	<b>480 (100)</b>	<b>4.9 (1.4)</b>	<b>2,120 (100)</b>

Demographic characteristics of the study populations are shown in Table 2. The total sample of 2,120 comprised nearly the same percentage of men and women (49% and 51%, respectively). A large proportion of the population were aged below 44 years (78%) and a small proportion of people (4%) was elderly (i.e. aged 65 years and over).

The educational level of the study population was quite limited. Only 17.6% of them had completed high school. Higher educational level was found in the 2 communes in the South as compared with those in the North.

The main occupation of the population in the studied areas was farming (55.1%); government staff accounted for only 1.8 %, small children/students comprised 31.1% and the other jobs (i.e. workers, traders, handicraft makers) made up 11.9%.

While a majority of the study subjects in the 2 communes in the South were Kinh people (99.8% in Xuan Dong and 72.5% in Xuan Tay), most of people from the 2 communes in the North belonged to the other minority groups i.e. Tay and Muong (74.5% in Lau Thuong and 82.6% in Phu Thuong).

**Table 2: Characteristics of studied household members**

<b>Characteristics</b>	<b>Xuan Dong</b>	<b>Xuan Tay</b>	<b>Lau Thuong</b>	<b>Phu Thuong</b>	<b>Total</b>
<b>Sex</b>					
- Men	286 (50.8)	273 (48.1)	243 (48.4)	237 (48.7)	1039 (49.0)
- Women	277 (49.2)	295 (51.9)	259 (51.6)	250 (51.3)	1081 (51.0)
<b>Age</b>					
- <15	164 (29.1)	178 (31.3)	115 (22.9)	113 (23.2)	570 (26.9)
- 15-24	146 (25.9)	137 (24.1)	100 (19.9)	88 (18.1)	471 (22.2)
- 25-44	136 (24.2)	127 (22.4)	173 (34.5)	181 (37.2)	617 (29.1)
- 45-64	108 (19.2)	104 (18.3)	83 (16.5)	80 (16.4)	375 (17.7)
- 64+	9 (1.6)	22 (3.9)	31 (6.2)	25 (5.1)	87 (4.1)
<b>Education</b>					
- No education	29 (5.2)	31 (5.5)	0	17 (3.5)	88 (4.2)
- Not yet complete with primary level	112 (19.9)	111 (19.5)	63 (12.6)	94 (19.3)	380 (17.9)
- Completed primary level	200 (35.5)	190 (33.5)	115 (22.9)	77 (15.8)	582 (27.5)
- Completed secondary school	155 (27.5)	152 (26.8)	212 (42.2)	178 (36.6)	697 (32.9)
- Completed high school	67 (11.9)	84 (14.8)	101 (20.1)	121 (24.9)	373 (17.6)
<b>Occupation</b>					
- Farmers	280 (49.7)	280 (49.3)	330 (65.7)	279 (57.3)	1169 (55.1)

<b>Characteristics</b>	<b>Xuan Dong</b>	<b>Xuan Tay</b>	<b>Lau Thuong</b>	<b>Phu Thuong</b>	<b>Total</b>
- Government staff	4 (0.7)	4 (0.7)	6 (1.2)	24 (4.9)	38 (1.8)
- Pupils/students	211 (37.5)	195 (34.3)	122 (24.3)	132 (27.1)	660 (31.1)
- Others	68 (12.1)	89 (15.7)	44 (8.8)	52 (10.7)	253 (11.9)
<b>Ethnicity</b>					
- Kinh	562 (99.8)	412 (72.5)	128 (25.5)	85 (17.5)	1187 (56)
- Others	1 (0.2)	156 (27.5)	374 (74.5)	402 (82.6)	933 (44)
<b>Total</b>	<b>563 (100)</b>	<b>568 (100)</b>	<b>502 (100)</b>	<b>487 (100)</b>	<b>2,120 (100)</b>

## 2. The Livelihood of the Tobacco Farmers in Vietnam

As shown in Table 3, people in the Southern communes had more lands than those in the Northern communes. The total planting area owned by each household in the tobacco-farming commune was larger than that in non-tobacco-farming commune from the same region. However, the difference was not significant.

**Table 3: Planting area owned by each household in 2006 (in sq. mt.)**

Commune	Mean	Sd
Xuan Dong	11,408	5,124
Xuan Tay	10,829	6,573
Lau Thuong	3,782	1,615
Phu Thuong	2,972	1,619

Table 4 presents the figures on area each household used for tobacco cultivation in the 2 tobacco-farming communes. In Xuan Dong commune (South), each household used about 3,200 sq. mt. of land for cultivating tobacco (or 31% of total planting area). In Lau Thuong commune (North), the area each household used for cultivating tobacco was about 2,300 sq. mt. (or 63% of total planting area). In both communes, the remaining planting areas were used for growing other crops such as rice, maize, manioc, etc.

**Table 4: Total area used by a household for tobacco cultivation in 2006 (in sq. mt.)**

Commune	Mean	Sd
Xuan Dong	3,187	2,337
Lau Thuong	2,271	888

Because the number of household members was quite similar between the 4 studied communes (Table 1), we have been able to use annual household income in assessing the economic situation of the households.

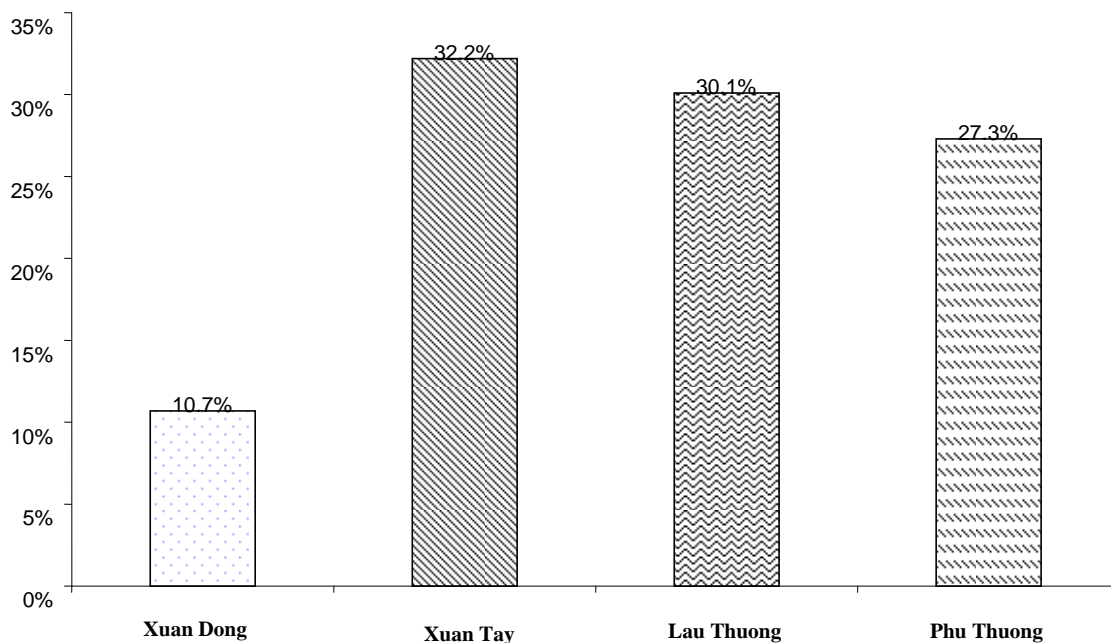
As shown in Table 5, in the South, the average annual income per household in the tobacco-farming commune was higher than that in the non-tobacco-farming commune. However, in the North, households in the tobacco farming commune had lower income than those in the non-tobacco-farming commune.

Similarly, the proportion of poor households, as classified by the local authorities (based on per capita income and area of land the household possessed), was lower in the Southern tobacco-farming commune compared to the non-tobacco farming commune in the region, whereas in the North, the proportion of poor households in the tobacco-farming commune was higher than those in the non-tobacco-farming commune (Figure 2).

**Table 5: Average annual income per household in different communes (VND)**

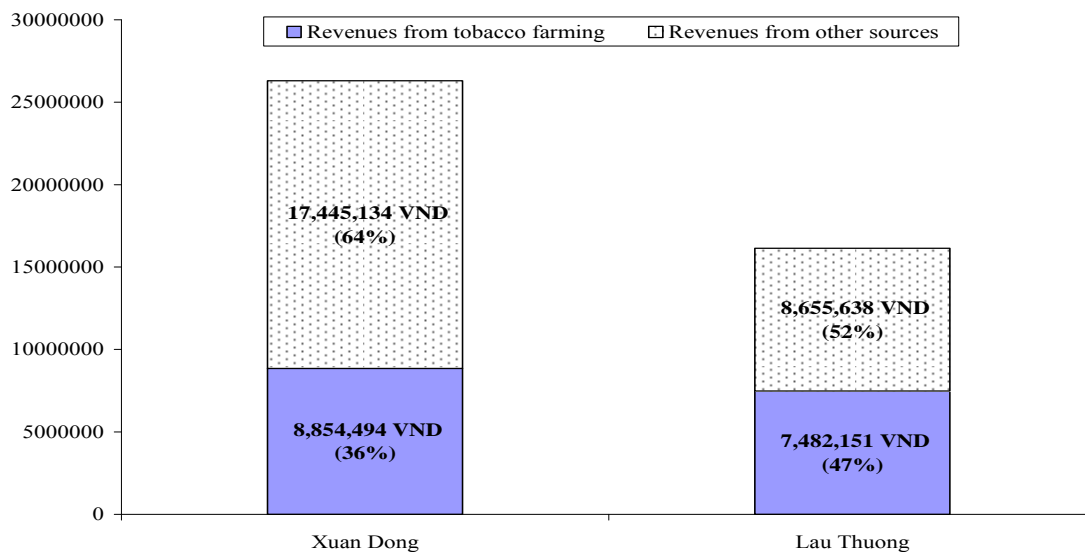
Commune	Mean	Sd
Xuan Dong	26,299,628	16,464,748
Xuan Tay	18,485,252	13,764,135
Lau Thuong	16,137,789	7,619,661
Phu Thuong	17,487,604	11,709,535



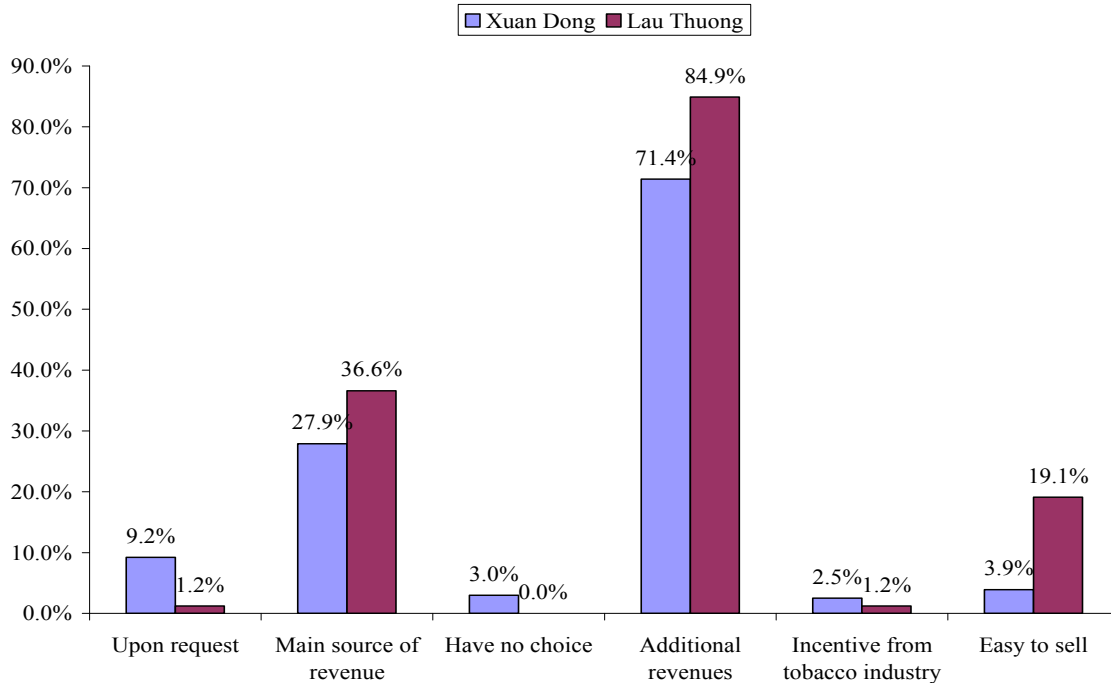


**Figure 2: Proportion of poor household in different communes in 2006**

In fact, in both of the 2 tobacco-farming communes, tobacco farming was not the main source of household revenue. Revenue from tobacco farming accounted for only 36% of total household revenue in the tobacco-farming commune in the South. The figure was 47% for the tobacco-farming commune in the North (Figure 3).



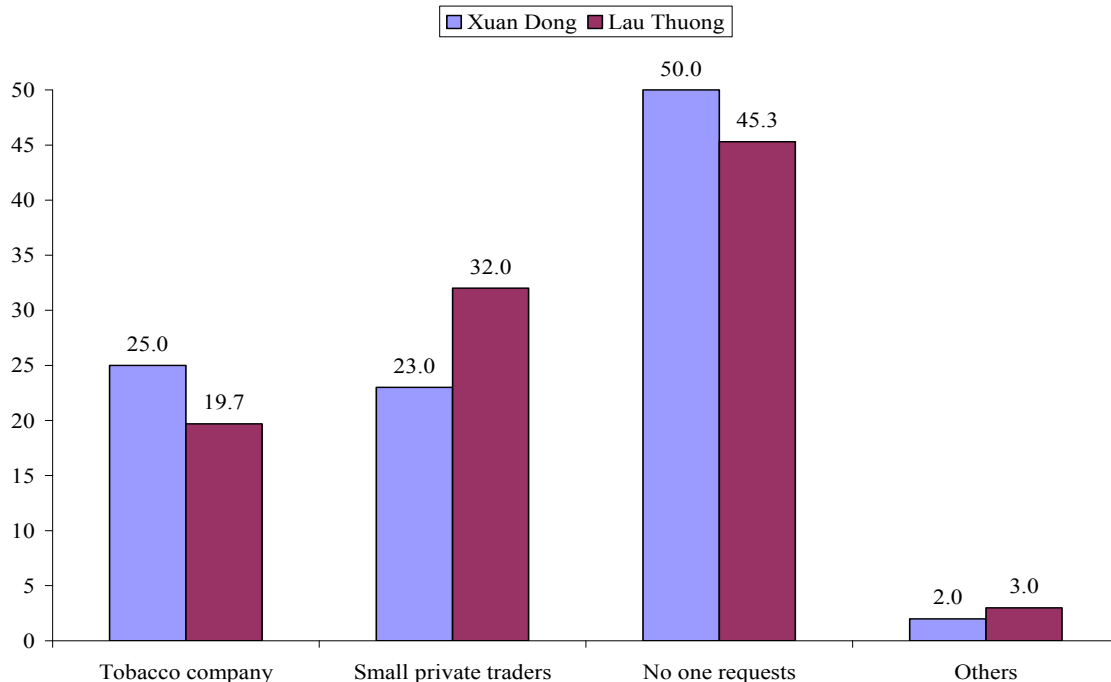
**Figure 3: Revenue from tobacco farming vs. revenue from other sources**



**Figure 4: Reasons for planting tobacco**

When asked about “reasons for planting tobacco”, most of the respondents reported that they had planted tobacco in order to earn additional revenues (71.4% in Xuan Dong, 84.9% in Lau Thuong). Only 27.9% of interviewees in Xuan Dong and 36.6% of those in Lau Thuong graded tobacco farming as the main source of their household revenue (Figure 4).

Most of the tobacco farmers reported that they had decided to plant tobacco by themselves (50% in Xuan Dong, 45.3% in Lau Thuong). 25% of respondents in Xuan Dong and 19.7% of those in Lau Thuong planted tobacco upon request of tobacco companies. 23% of tobacco farmers in Xuan Dong and 32% of those in Lau Thuong did it upon request of some small traders (Figure 5).



**Figure 5: Agencies/persons who requested planting tobacco**

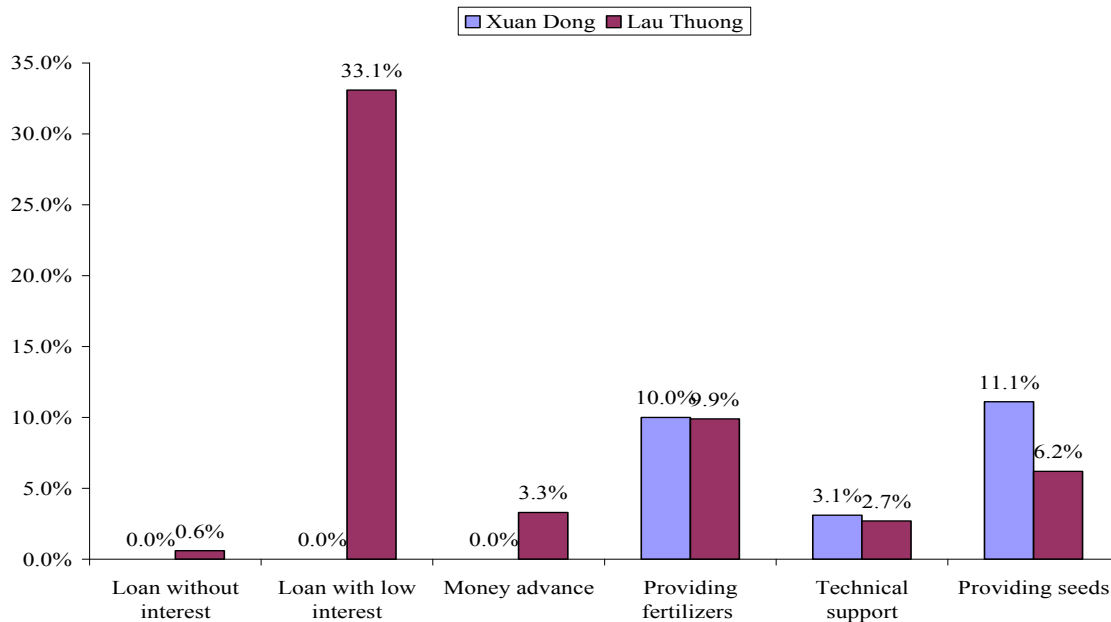
The main supports that tobacco farmers got from the requesters were fertilizers, seeds and technical support. In Lau Thuong, tobacco farmers could get loan at low interest rates (Figure 6). However, the supports were very limited.

Results from qualitative data also showed that the supports that the farmers received in the form of money, fertilizers, and seeds were not the same for all tobacco farming households and they were, to some extent, not reliable. Almost all informants agreed that if farmers really needed help (usually money), they could request tobacco companies for low interest loans or other supports.

*“General speaking, if we are short of money or need other things, we go and ask them [tobacco companies]; they will also invest money, fertilizers etc. Then, at the end of the tobacco growing season we have to pay them back” – FGD 1 - Dong Xuan.*

However, many tobacco farmers did not “use” the supports from tobacco companies and some found the supports were not useful. So at the end of the day, most of tobacco growing households managed the tobacco cultivation work by themselves.

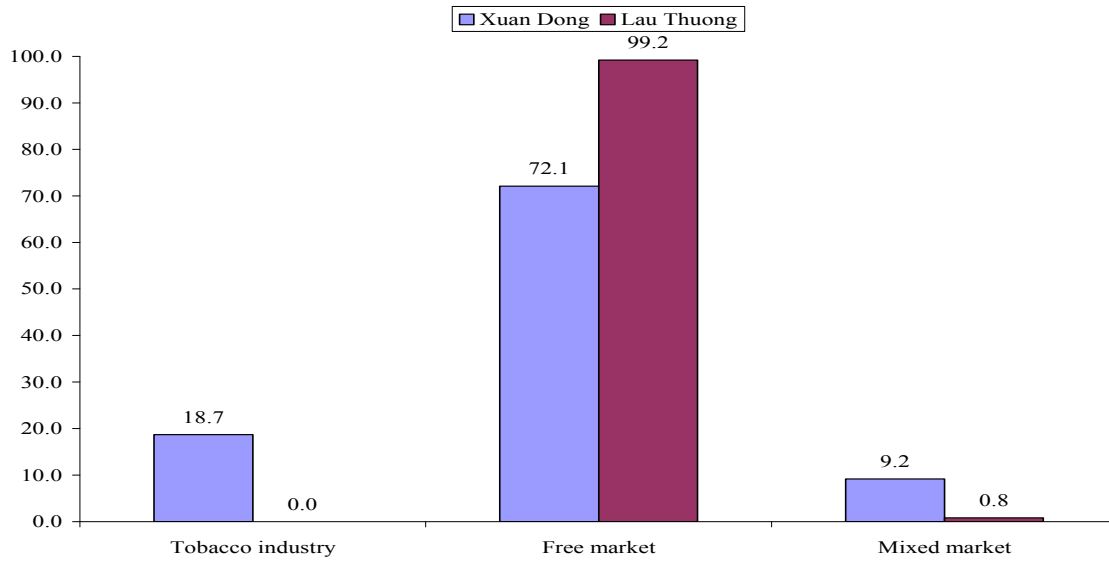
*“Yes, nobody [from the tobacco companies] provided technical support. For example, last year I brought a bunch of tobacco leaves from the tobacco company and asked about the disease that attacked the plant - nobody could answer me. Even now, the company still does not know... Nobody helps us [farmers] in terms of techniques. We have to manage by ourselves” – FGD 1 - Lau Thuong*



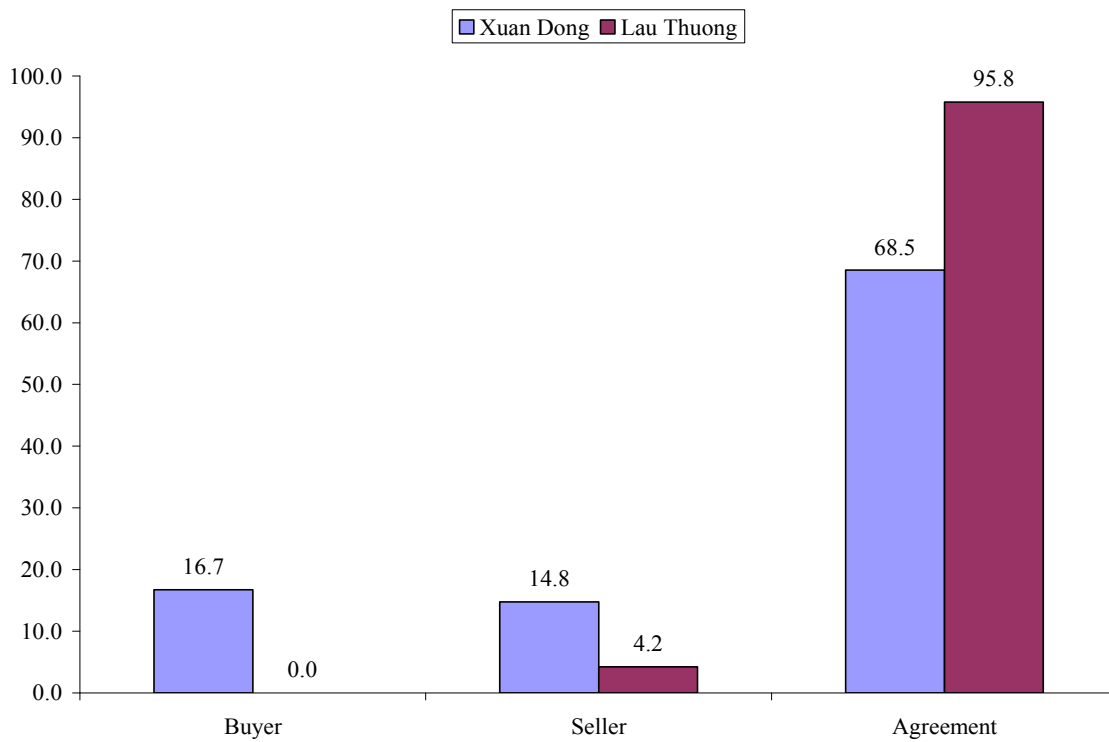
**Figure 6: Supports from tobacco companies to farmers**

The market place for tobacco products was reported to be not secured. Most of the tobacco farmers said that they had to sell their tobacco products in the free market. Tobacco companies had bought directly from the tobacco farmers (Figure 7) but small amount. This finding from the quantitative study was also confirmed in the qualitative study. Most of the informants reported that tobacco farmers mainly sell their products in the free market to small traders. The reasons being that tobacco companies set a lower price for the products than small traders and also under-classify the quality of the tobacco leaves. These factors contributed to the decision of farmers in non-tobacco farming communities to give up growing tobacco.

*“In the past, many households in this commune also grew tobacco. However, when we brought first class or the best tobacco leaves to the companies, they were classified as second class, and the second was identified as third class so people here felt that it was so difficult and hard for them and so the people gave up growing tobacco”. FDG 1 - Xuan Tay.*



**Figure 7: Market place for tobacco products**



**Figure 8: Decision on the price of tobacco**

Even though the majority of farmers reported that the price of the tobacco products was set based on the agreement between buyers and sellers (Figure 8), the price was not stable over time. Many tobacco farmers and key informants including both communes' leaders as well as heads of community health centers in the North and South attributed the instability of tobacco price to known and unknown reasons. For example, last year tobacco farmers in Lau Thuong – tobacco growing commune in the North – sold tobacco at the price of 18.000-20.000 VND/kg (US\$1.20-1.33). But this year the price was just 12.000-13.000 VND/kg (US\$0.80-0.87). And the year before last year, it was not worth selling tobacco (*cha bo*).

*“Tobacco has been smuggled into some border provinces [with China]. Therefore in chiem and xuan seasons this year tobacco price was fine at the beginning then decreased dramatically” - IDI – L - Lau Thuong*

*“The time when tobacco was sold at a good price was unpredictable, sometimes it was at the beginning or end of the season, other time it was in the middle of the season. It is similar to doing business; who can predict the price!...Tobacco price is not as stable as maize price” – FGD 1 - Lau Thuong*

*“It is truly [determined by] the market; frankly speaking it is market price. Farmers could not decide the leaf price. There was a year the price was high and there was a year the price was low; farmers here say that it is all luck (hen xui) – tobacco price is unstable (gia ca bong bieng)” – FGD 2 - Xuan Dong.*

Although the majority of tobacco farmers reported in the quantitative survey that tobacco price was set by agreement between them and the buyers, the qualitative study provided more in-depth findings related to the bargaining power of farmers. The findings showed that tobacco farmers actually did not have bargaining power and had experienced various pressures. Depending on their circumstances, farmers were often forced to sell their products to companies or mainly to small traders (*hang xao*) under pressure. For instance, in the South, there was only one company which was buying from farmers, so tobacco farmers had no choice but to sell to that company. In addition, the urgent need of money and the impossibility to keep tobacco leaves for a long time also reduced the bargaining power of the tobacco farmers.

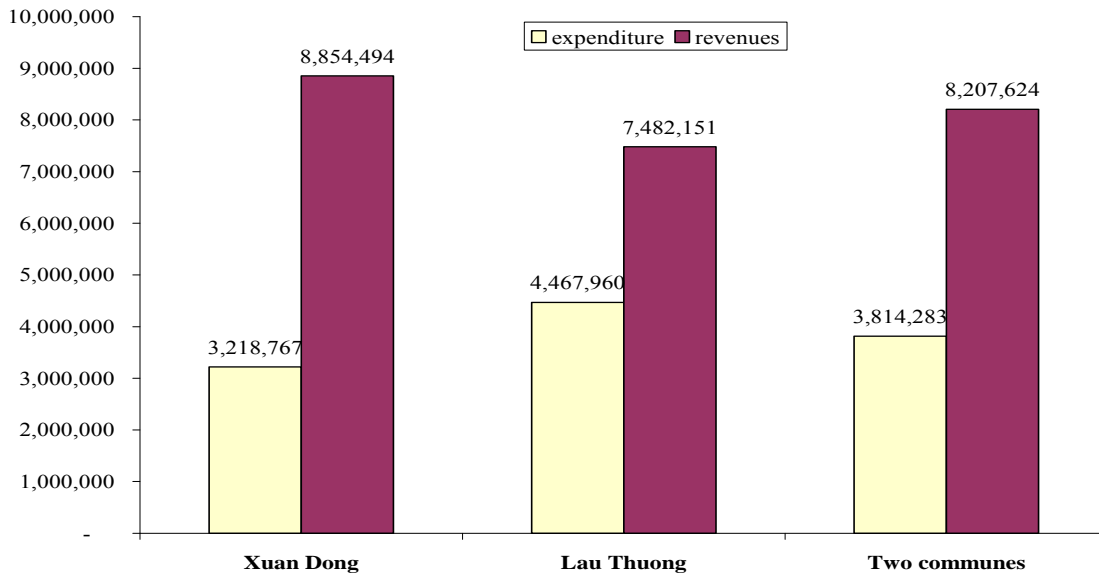
*“I also signed a contract with a tobacco company, who then sells seedlings to me. So the price and tobacco classification are already done by the company in advance. When I sell the product the price is fixed. I can not set the price” – FGD 2\_Xuan Dong*

*“Price is decided by the company according to product quality classification set by them (company staff)...we had to sell tobacco leaves at any price anyway (re dat gi cung ban), otherwise these leaves would become priceless if we bring them back home because the product would be rotten” – FGD 1 - Xuan Dong*

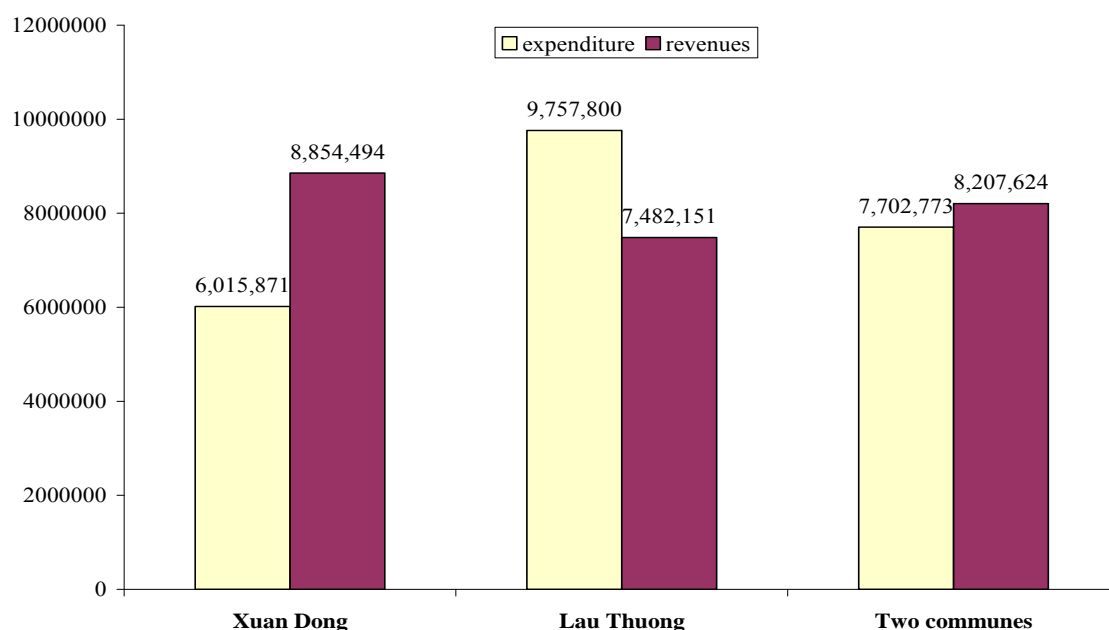
*“...if we could not sell other products [rice, maize] we could store them and it was ok, nothing would happen to these products. But for tobacco leaves if we store them for long we can not solve the problem (rottenness)... Small traders often put down tobacco price (ep gia xuong) because they knew farmers were in urgent need of cash. In many cases, if*

*it was just reducing one price (giam 1 gia) or something like that farmers would agree to sell” – IDI – H - Phu Thuong*

Figure 9 shows the data on the average amount of money each household spent a year on tobacco farming and revenue from that harvest. As the expenditure figures did not include personnel costs since family members were used as labor, it seemed that the tobacco farmers did receive some benefits from planting tobacco. However, if personnel costs were added (payment for a working day  $\times$  number of working days), the benefit became very small. In Lau Thuong commune, the expenditure on tobacco farming was even higher than the revenue (Figure 10, Table 6). The cost of planting 1,000 sq. mt. of tobacco was about 2 times higher than the cost of planting 1,000 sq. mt. of maize or rice (Figure 11). Unfortunately, in this study, because most of the farmers usually used maize and rice for food, we could not get the figures on revenue from maize or rice.



**Figure 9: Annual household expenditure on tobacco and corresponding revenue (personnel costs not included, VND)**



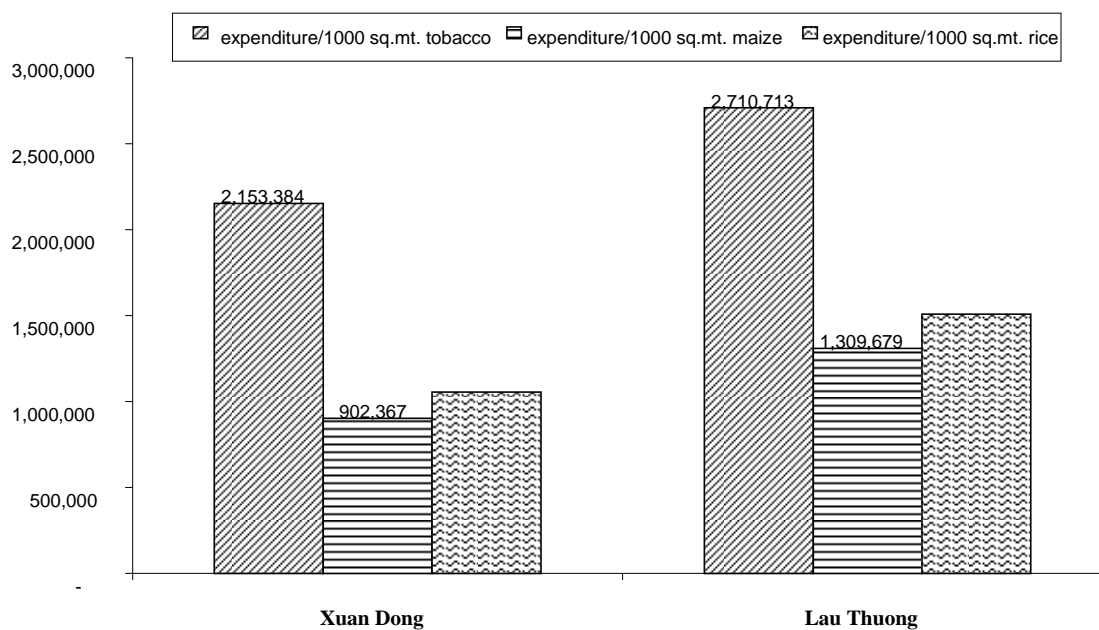
**Figure 10: Annual household expenditure on tobacco and corresponding revenue (personnel costs included, VND)**

**Table 6: Annual household expenditure on tobacco and corresponding revenue by proportion of land used for tobacco growing (personnel costs included, VND)**

Commune/ (% of land used for tobacco growing)			<25%	25-49%	>50%	Overall
Xuan Dong	Expenditure	mean	3,445,868	7,968,842	10,288,559	6,015,871
		sd	3,749,823	3,416,517	2,926,443	4,400,864
	Revenue	mean	8,612,192	8,323,571	11,683,750	8,854,494
		sd	8,135,908	4,734,622	7,401,017	6,989,701
	Revenue-Expenditure	mean	5,166,325	32,878	-	2,355,780
		sd	8,899,269	4,059,429	4,245,991	7,481,457

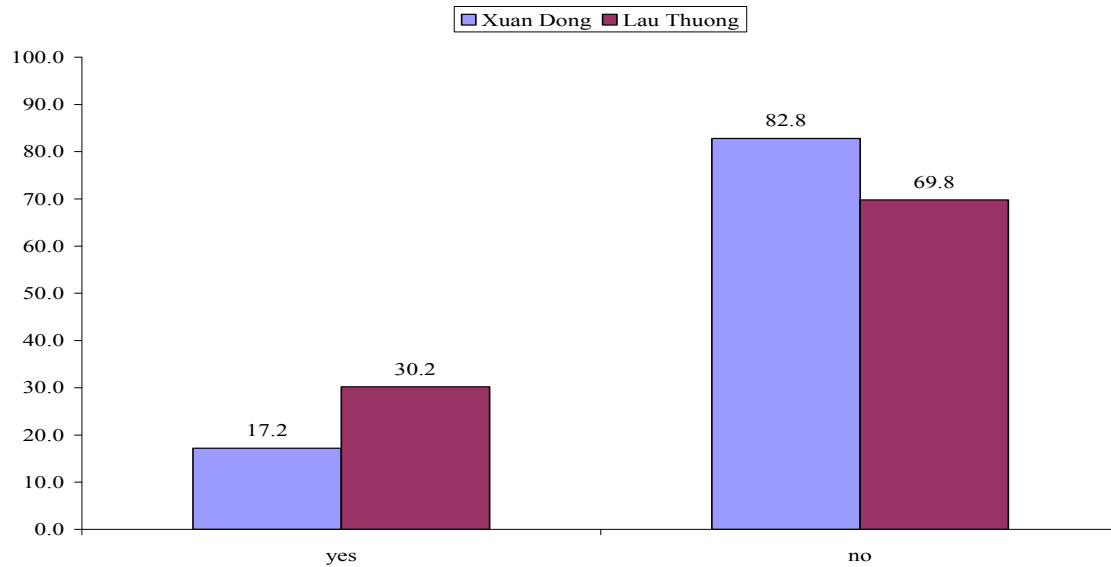


<b>Lau Thuong</b>	<b>Expenditure</b>	mean	5,698,909	8,372,405	10,405,317	9,757,800
		sd	3,554,669	4,070,763	3,506,398	3,835,444
	<b>Revenue</b>	mean	8,375,000	5,979,508	8,030,535	7,482,151
		sd	2,895,399	3,532,118	4,943,696	4,659,281
	<b>Revenue-Expenditure</b>	mean	4,210,182	-2,342,233	-	-2,648,307
		sd	1,611,333	3,928,660	4,297,176	4,304,885



**Figure 11: Expenditure on 1000 sq. mt. of different crops (*personnel costs included*)**

Tobacco could even cause tobacco farmers to go into debt. For instance, 17.2% of households in Xuan Dong and 30.2% of those in Lau Thuong were reported to be indebted because of last year's tobacco harvests (Figure 12).



**Figure 12: Indebted because of tobacco farming**

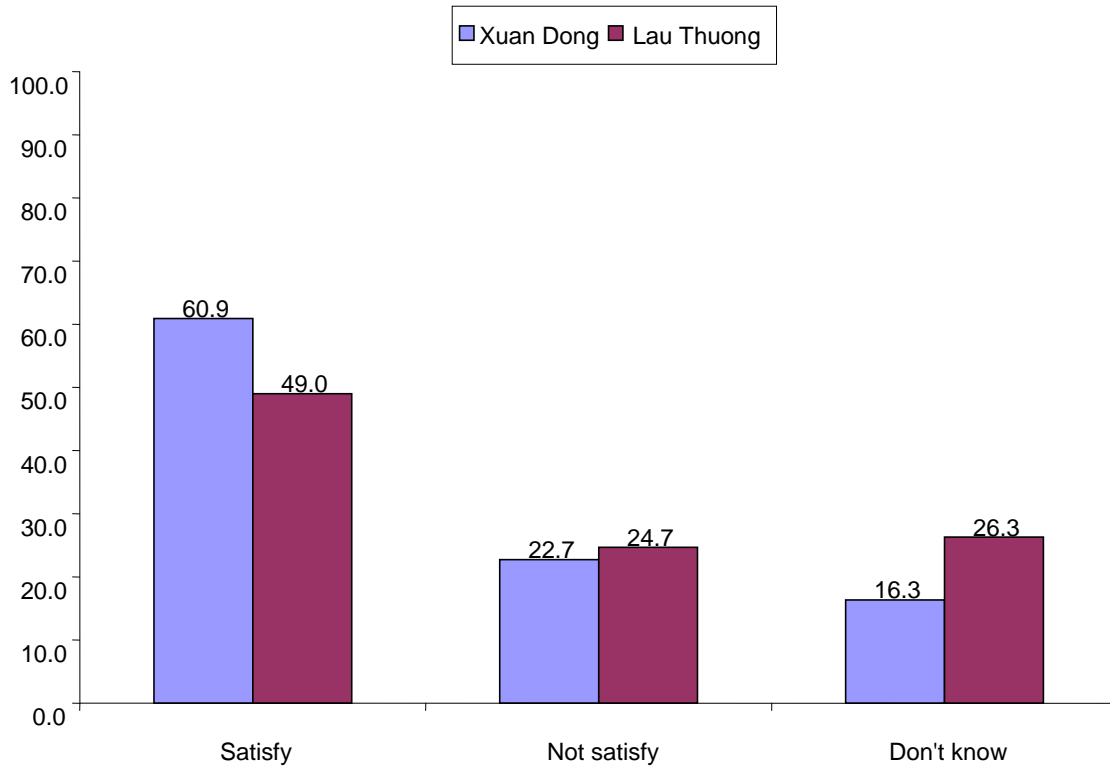
In total, only about half of tobacco farmers reported that they were satisfied with tobacco growing. More farmers in the South (60.9%) than those in the North (49.0%) felt satisfied with their tobacco cultivation (Figure 13). The study found that while tobacco farming could bring additional income to households because it utilized the land and the free time that the farmers as well as other members in the families including children, it nonetheless was labor intensive, and had caused insecurity in farmers' economic lives such as resulting in indebtedness, despite proclamation from tobacco companies that tobacco growing could bring prosperity to farmers.

*“Growing rice will directly give everyday food for the families but growing tobacco means we can get starved to death if we can not sell the tobacco. Last year, we already experienced this problem. Many people who grew tobacco could not sell their products so they were indebted because they could not pay for fertilizers and other things already bought in advance...” - FGD 1 - Phu Thuong.*

Qualitative data also clearly showed that farmers were not really satisfied when doing tobacco work.

*“In comparison to growing other crops such as coffee and pepper, tobacco farming is more labor intensive and brings less income, just enough for living but not enough for savings” - FGD 1 - Xuan Dong.*

In addition, the reasons for not being satisfied in the order of priority were the instability of tobacco price, less capacity to select and negotiate with buyers, labor intensive, and unpleasant experiences in terms of smell, and health problems.

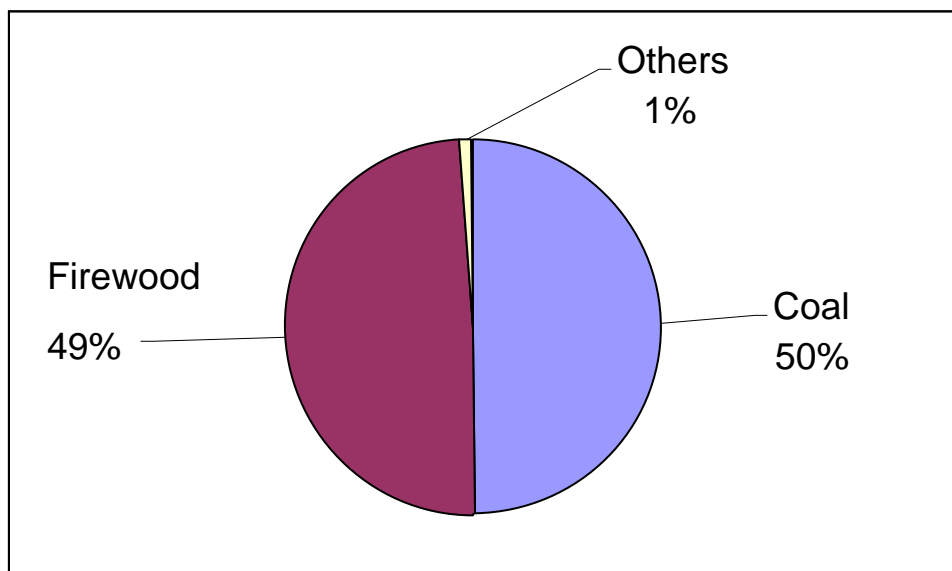


**Figure 13: Satisfaction about tobacco growing**

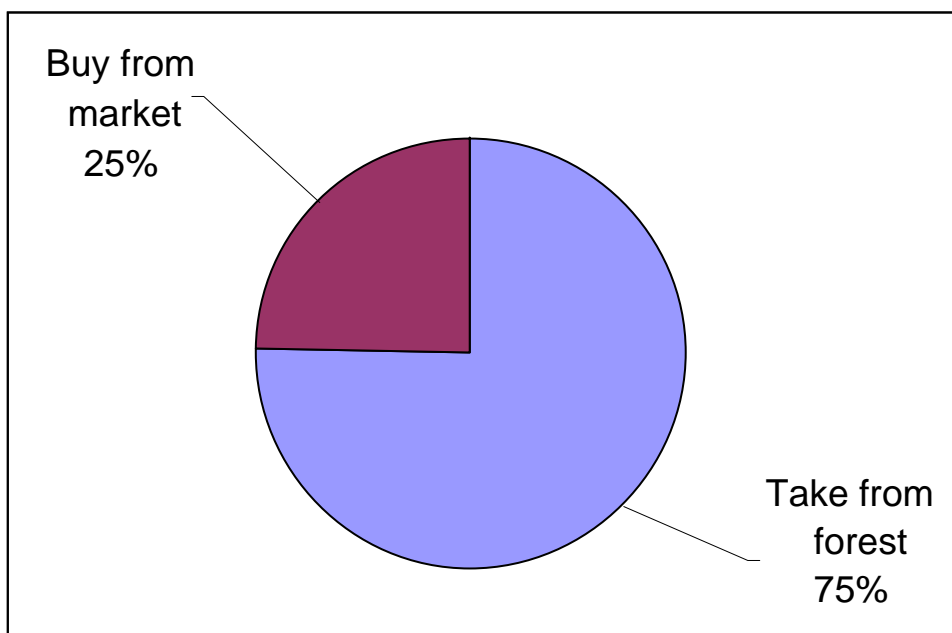
### **3. Pesticide and Fertilizers Used in Tobacco Farming**

We did not find any significant difference in the quantity of pesticides and fertilizers that the farmers used for different crops like tobacco, maize and rice. However, tobacco farmers often used pesticides that are highly toxic such as aldicarb, chlorpyrifos and 1, 3-dichloropropen (1, 3-D) on their tobacco crops. In terms of fertilizers, maleic hydrazit was most commonly used.

Most of the tobacco farmers used coal or firewood in curing tobacco leaves (Figure 14). 75% of tobacco farmers reported that they took woods from the forest for curing tobacco (Figure 15).



**Figure 14: Main sources of energy for curing tobacco**



**Figure 15: Sources of woods for curing tobacco**

#### 4. The Association between Tobacco Farming and Self-reported Illness

A total of 968 farmers aged from 15 to 69 years old with 2 farmers, on the average, from each randomly selected household were interviewed for this study. Self-reported illness of the study populations was measured using 16 item scales with 5-point response format ranging from never to always. These 16 items generally measured symptoms related to green tobacco sickness (GTS) – a form of nicotine poisoning that affects workers who have direct contact with tobacco leaves during cultivation and harvesting. These symptoms often include headache, nausea, vomiting, weakness, pallor, dizziness, increased perspiration, chills, abdominal pain, increased salivation etc. For this scale, a higher score means more severe symptoms of health problems related to GTS.

The reliability in terms of internal consistency of this scale measured by Cronbach's Alpha coefficient was good ( $\alpha = .83$ ) (17).

Table 7 presented the percentage of respondents reported they had ever experienced these 16 symptoms during the last six months. As we can see from the table, the prevalence of 13 out of 16 symptoms among tobacco growing farmers was higher than that of non-tobacco farmers. Moreover, the prevalence increases were statistical significant in 10 out of these 13 symptoms. Notably, the rates of tiredness/weakness, nausea, increased perspiration/sweating, chill, increased salivation, poor appetite, itchiness and rashes were markedly increased in the tobacco cultivation group.

**Table 7: Self-reported illness during the last six months**

	<b>Symptoms</b>	<b>Tobacco growing farmers (%)</b>	<b>Non-tobacco growing farmers (%)</b>
1.	Tiredness/weakness	90.0***	76.5
2.	Nausea	28.8***	18.9
3.	Vomiting	10.8	12.8
4.	Dizziness	58.7	63.2
5.	Headache	77.6	72.4
6.	Abdominal pain	28.0*	34.2
7.	Insomnia	56.2	50.4
8.	Difficulty	24.3	21.0

	<b>Symptoms</b>	<b>Tobacco growing farmers (%)</b>	<b>Non-tobacco growing farmers (%)</b>
	breathing/shortness of breath		
9.	Increased perspiration/sweating	66.6***	27.6
10.	Chill	20.5***	11.5
11.	Heart rate	26.8*	20.2
12.	Pallor	17.4	13.4
13.	Increased salivation	12.2*	7.8
14.	Whole body dull pain	85.9*	79.8
15.	Poor appetite	48.1***	32.5
16.	Itchy, rashing	23.4***	14.0

\* $p < 0.05$ ; \*\*\*  $p < 0.001$

The mean and standard deviation (SD) of self-reported illness scale by groups of farmers are presented in Table 8. Tobacco farmers reported more than 3 points higher in the mean score measuring illness in comparison to non-tobacco farmers.

**Table 8: Mean and standard deviation of self-reported illness scale by groups of farmers**

<b>Group</b>	<b>Number of farmers</b>	<b>Mean (CI)</b>	<b>SD</b>
Tobacco farmers	482	30.27 (29.57-30.97)	7.82
Non-tobacco farmers	486	27.11 (26.46-27.76)	7.29
Total	968	<b>p&lt;.0001</b>	

Mann-Whitney test was also performed to compare the means of self-reported illness score according to groups of farmers. The result showed that tobacco farmers had significantly more illnesses than non-tobacco farmers ( $z = 6.67, p < .0001$ ).

In this study, the level of involvement in tobacco farming was classified not only by *yes/no* (dichotomous variable) but also by continuous variable which measured the involvement of farmers in different types of work of tobacco cultivation like sowing, transplanting of seedling, topping or flowering buds, disbudding of axillary buds (suckers), harvesting of leaves and plants, separation of leaves, curing and storing. This scale was constructed for this study using 6 items including various tobacco farming activities with 3-point scale (*never, sometimes and always*). Higher score indicates higher intensity of tobacco farming. The reliability in terms of internal consistency of this scale was very good ( $\alpha = .91$ ) (17).

To examine the association of intensity of tobacco farming and farmers' self-reported illness in this study, it was essential to control demographic variables known to potentially influence farmers' health problems such as sex, age and family economic status. Multivariate linear regression model was performed to explore the relationship between level of tobacco farming and health of the farmers after adjusting those demographic variables mentioned above. Results of multivariate linear regression model are displayed in Table 9.

**Table 9: Results of multiple linear regression analysis of the association between level of tobacco farming involvement and illness**

<b>Variables</b>	<b>Coefficient</b>	<b>Standard error</b>	<b>P value</b>
Sex (male vs. female)	-.091	.016	.0001
Age	.003	.001	.001
Family economic status	.051	.019	.008
Intensity of tobacco farming	.013	.002	.0001
Constant	3.13	.039	.0001
Adjusted R <sup>2</sup>	.077		

In the multiple linear regression model, we found that there was significant dose-response relationship between tobacco cultivation involvement and self-reported illness after controlling demographic variables. It means that the more farmers were involved in tobacco farming the more illnesses were reported.

## **5. The Roles of Child and Woman Labor in Tobacco Farming**

### **5.1 Child Labor**

For the purpose of this study, child labor was defined as children below 15 years of age, engaged in any of the phases of tobacco farming, whether on full-time or part-time basis. The children might be working for their parents or relatives or for others in the community.

According to community informants and focus group discussions of farmers alike, the participation of children in tobacco production was a common practice in the life of the two communes in the study. Qualitative information also revealed that child labor was more common in tobacco farming than in other crops because tobacco cultivation was more labor intensive.

*“Growing tobacco required much more working time and labor than other crops like rice or maize... Children aged from about 10 and above had to work for their families” - IDI\_H\_Lau Thuong*

*“Generally speaking, in comparing tobacco cultivation to other crops it was clear that growing tobacco involved intensive child and woman labor. This was what I observed in reality” – IDI – L - Phu Thuong*



*“Tobacco farming was labor intensive in all stages, especially at the stage of harvesting and curing. Growing tobacco involved much harder work than growing maize, rice, or beans. Therefore, families with few people would not cultivate tobacco and tobacco farming had mobilized more child and woman labor” – FGD 2 - Lau Thuong*

Most of the informants perceived that participating in tobacco production was children’s responsibility to help their families. Moreover, child labor was taken for granted and on the average children at the age of about 10 years old had to start participating in tobacco farming. At such young age children were required by their families to accomplish a variety of simple tasks from planting to sticking (*len sao*).

*“Agricultural work is the responsibility of the children. This is especially so in tobacco farming which creates more job for both adults and children” – IDI - L - Lay Thuong*

*“If a family grows tobacco, child labor is very common because children can do almost all tobacco farming activities. In general, children from 10 years of age can participate in tobacco growing” – IDI - L - Xuan Tay*

*“Commonly, children as young as 9 or 10 years old have to do tobacco farming. However, in some families, children started working at a very young age...Sometimes, 7 or 8 year-old children already had to participate in tobacco growing. My children started working when they were just in Grade 1 in primary school [6 years old]” – FGD 1 - Xuan Dong.*

The majority of the children of these tobacco farming communes did not get paid for their work in the tobacco farm. The work assigned to children was not always time-consuming and they were able to finish their tasks before going to school and upon their return in the afternoons. What drove them to work was the desire to help their families. For most of the children, work was part-time and seasonal. They went to the fields or worked at home before leaving for school, when school was over in the afternoons, on week-ends and during school breaks.

What was evident from the discussions with the village farmers was that parents did not force their children to work on tobacco farms for other farmers for money. However, some children did work for others for money.

*“My child is studying in Grade 4 but still works for the neighbors or any families in my community without my permission. He can earn about US\$0.70 (10.000 VND) for 2-3 hours of work” - FGD 2 - Xuan Dong.*

Even though children engaged in a variety of tobacco cultivation activities such as seedbed preparation, weeding, in planting and transplanting operations, harvest and post-curing operations, and uprooting the plants; the majority of the informants agreed that the most common work of children was sticking tobacco leaves on bamboo sticks and sun drying them.

## 5.2 Woman labor

It takes about four months to grow tobacco, from sowing the seeds to selling the leaves, and a great deal of labor is required during that period. It is important to note that women are vital at almost all stages of tobacco farming. As explained in all the in-depth interviews and FGDs, most of the tobacco farm work was taken cared of by women. Women not only have the same role with their husbands of economic producers though their labor, but also have added weight of their roles as mothers - bearing children, child-rearing and household management.

*“Actually, for tobacco farming households, apart from other housework responsibilities, women work very hard and play an essential role in tobacco production...Human resource for tobacco farming is mainly women.” – IDI - L - Lau Thuong.*

*“Even though everybody had to do tobacco farming tasks but we [women} played a key role. During the tobacco season, all women [including pregnant women] had to work day and night (lam toi ngay) because there is only one season in a year so we had to work regardless of our conditions” – FGD1 - Xuan Dong*

Despite the fact that men and women led equally hard lives, there were different expectations that govern men’s and women’s labor in tobacco production. Men took care of heavier tasks while women performed the lighter ones. For example, men in both the North and the South were assigned heavier work such as taking woods from the forest, watering and chemical spraying.

*“Men normally only participate in tobacco planting. After planting they go to the forest to look for woods. Women’s role is not to do very heavy work. People do not require women to do too heavy work in comparison to their physical capacity. However, women have to work much more often (luon tay luon chan) than men” - FGD 1 - Lau Thuong.*

Although women’s tobacco farming activities were actually more or less physically demanding than those undertaken by men, perhaps more important was the total amount of tobacco growing work women contributed. When farmers were asked to estimate the average percentage of women’s share in tobacco farming work in each household, almost all informants agreed that women work accounted for approximately 60% to 70% of the total amount of tobacco production activities.

Focus group discussions also highlighted the fact that, for some women, their tobacco farming burdens had been exacerbated by their husbands finding job outside home and village. They (husbands) were often gone for long periods of time as they search for paid labor elsewhere. As a result, some women had to be solely responsible for managing tobacco growing.

## DISCUSSIONS AND RECOMMENDATIONS

This study, using mix-method approach reported on the livelihood of the tobacco farmers, and explored the relationship between health symptoms related to GTS and tobacco cultivation from communities in both the North and the South of Vietnam. Further, the study also preliminarily described the usage of pesticide and fertilizers as well as the role of child and woman labor in tobacco farming. To the best of our knowledge, this study was among the first of its kind to be conducted in Vietnam. This study had generated a number of valuable findings surrounding tobacco farming, not only improving knowledge of socio-economic and health effects of tobacco growing but more importantly providing sound evidence for dissemination to the general public and policy makers at different levels in Vietnam. This would help to advocate for better tobacco control policies.

1. The demographic characteristics of the study populations were typical for rural communities in Vietnam. Educational level was low and farming was the predominant occupation. The distribution of age and sex in the population corresponded well to the usual pattern of population pyramid in Vietnam, which had a small proportion of elderly people.
2. This study preliminarily described the livelihood of the tobacco farmers from communities in both the North and the South of Vietnam. The findings of this study indicated that tobacco farmers were not wealthier than the other farmers. Even though tobacco cultivation seemed to have slightly increased income level of the tobacco farmers in the South, it did not help the tobacco farmers in the North in improving their economic situation. Tobacco farming communes in the North had lower income level and had more poor people. This was contrary to what was divulged by the tobacco companies that “tobacco brings prosperity to its farmers” (18) and “tobacco is an important solution for hunger elimination and poverty reduction” (19). In fact, 17.2% of households in Xuan Dong and 30.2% of those in Lau Thuong were reported to be indebted because of last year’s tobacco harvests.
3. The findings on tobacco expenditure and revenue also confirmed the fact that tobacco did not bring much benefit to the farmers. The situation was called “benefits are due to hard physical works”. The benefit the farmers could get would have been much higher if they had done some thing else or even hired by someone to do some physical works instead of investing in tobacco farming. Economic scale for tobacco cultivation were not very favorable in comparison with other crops. As a result, tobacco had never been the main source of household revenues, even in communities with a long tradition of planting tobacco like Xuan Dong (South) and Lau Thuong (North). This was in line with the observation by Panchamukhi about economic scale for tobacco (20). This finding was the opposite to what was reported by the tobacco industry that revenues from tobacco would be about 2-3 times higher that that of rice, maize, sugar cane, etc (18, 19).
4. Even though a large proportion of farmers had planted tobacco upon requests of tobacco industry or small traders, the support that the tobacco farmers got from the requesters were limited and not stable. The market place for tobacco products had not

always been secured. This was in contrast to the “flatter advertisements” put out by the tobacco industry about “providing full support in terms of investment, seeds, planting techniques, etc” to tobacco farmers and “securing the market” (21). Even though about 60% of farmers in the North and more than 90% in the South reported in the quantitative survey that the tobacco price was set by agreement with buyers, these figures should be interpreted with caution. This was because the qualitative study which provided more in-depth findings related to the bargaining power of farmers showed that tobacco farmers actually did not have real bargaining power and had experienced various pressures regarding price negotiation.

5. Most of the tobacco farmers used pesticides that are highly toxic. Pesticides like aldicarb, chlorpyrifos and 1, 3- dichloropropen (1, 3-D) that can lead to acute poisoning in humans. 1,3-D can cause different types of cancers. Fertilizers like maleic hydrazit can cause skin and eye irritations (22).
6. Most of the tobacco farmers used coal or firewood in curing tobacco and most of them took woods for curing tobacco from the forest. This is actually a bad practice as it would lead to deforestation. Flue-cured tobacco has been proven to be a threat to ecological functions in a number of studies (23). In Vietnam it was estimated that 1.4% of forest areas were destroyed because of tobacco planting purposes (22, 24). Tobacco cultivation has also contributed to an environmental crisis in a number of countries. In many developing countries firewood is used as fuel to cure tobacco leaves and to construct curing barns. An estimated 200,000 hectares of forests and woodlands are cut down each year because of tobacco farming (9, 25).
7. The health risks associated with smoking tobacco and exposure to secondhand smoke (SHS) are well known. Less well-known are the health effects related to tobacco growing. The consequences of tobacco growing among tobacco workers, include green tobacco sickness (GTS), an occupational illness reported by tobacco farmers worldwide (6). Much of the research on GTS has focused on American tobacco harvesters. In developing countries, there is limited evidence on the relationship between tobacco farmers and GTS-related self-reported illness (26). This was the first study in Vietnam to explore this association. Self-reported illness in this study was measured using 16 item scale which proved to have good reliability in terms of internal consistency. We focused first on comparing the prevalence of these 16 symptoms between two farmer groups. The results clearly showed that growing tobacco was strongly associated with reporting GTS-related symptoms. This was followed by comparing the mean scores measuring the illnesses between non-tobacco farmers and tobacco farmers. It was apparent from this study that tobacco farmers had significantly more illnesses than non-tobacco farmers. These findings again confirmed what was already reported on the health effects due to occupational exposure during tobacco cultivation in other countries (27) (28) (26). Furthermore, we looked deeper into the health effects on tobacco cultivators by examining the dose-response relationship of different levels of involvement in tobacco farming with self-reported illness. Using multivariate linear regression analysis to control some demographic factors, the results of our study strongly supported the hypothesis that an increase in the level of involvement in tobacco cultivation significantly increased the

risk of tobacco workers having health problems. These findings can be explained by the fact that the tobacco workers come into contact with green tobacco leaves and the plants during the various processes of tobacco cultivation and absorb nicotine through a dermal route. The toxicity of nicotine depends on the amount of nicotine absorbed (6). And the more the farmers are involved in tobacco growing activities, the more the farmers will be exposed to nicotine.

8. In this study we used qualitative approach to preliminarily describe the role of child and woman labor in tobacco farming in Vietnam. Consistent with previous reports elsewhere (29, 30) this study also found that the utilization of the labor of young children below the age of 15 was a common practice in the tobacco farms in Vietnam. Children engaged in a variety of tobacco cultivation activities such as seedbed preparation, weeding, in planting and transplanting operations, harvest and post-curing operations, uprooting the plants etc. The majority of the children of tobacco farming communes in this study did not get paid for their work and they worked mainly to help their families. The tobacco sector is not unique in its use of child labor; however, child labor is more common practice in tobacco farming than in other crops because tobacco cultivation was more labor intensive. This intensive involvement in tobacco work places these children particularly vulnerable to tobacco hazards to health and risks to their physical development and as such demands urgent attention (31).
9. Similar to the findings regarding child labor mentioned above and in line with what was reported worldwide, woman labor was widespread and essential at almost all stages of tobacco farming in this study. It was estimated that women's work accounted for approximately from 60% to 70% of the total amount of tobacco production activities. These findings came from a relatively small number of focus group discussions and in-depth interviews conducted in 4 communes in Vietnam and, therefore, should not be taken as representative of all tobacco farming areas in Vietnam. However, they raised important issues related to gender equality, and the social and health impacts of tobacco growing on this other vulnerable group.
10. As mentioned, this study was among the first of its kind to be conducted in Vietnam. The study provided valuable evidence surrounding the socio-economic and health effects of tobacco farming in the Vietnamese context. Although the study was designed and implemented carefully, the methodological limitations must be taken into account in the interpretation of the findings. Due to some constraints like time, we used retrospective approach to collect different types of information such as income, expenditure, and self-reported illness. Because of recall bias, the information we collected might not be completely accurate, especially the information on annual income and expenditures on different items such as fertilizers, pesticides, the names of pesticides, fertilizers, etc. Equating all types of pesticides and fertilizers in the analysis when estimating amount of pesticides used was another limitation. But we could not estimate the amount of pesticides and fertilizers used for each subgroup classified by its toxicity level because the respondents were more likely to remember the amount consumed rather than the names of pesticides or fertilizers.

The validity of self-reported information also depends on the characteristics of both interviewers and respondents. Probing skills of interviewers were very important. In this study, village health workers were selected as interviewers because they already had some experience in conducting household interviews. However, this was the first time they did interviews using a long questionnaire with quite a number of difficult questions such as estimation of expenditure, revenue, name of fertilizer, pesticide, etc. Even though the trainings were conducted carefully, the interviewers still made a number of mistakes. As a result, about 5% of interviews were repeated by researchers of this study.

The characteristics of respondents such as their educational level, their ability to recall and their willingness to report it, might also have influenced the validity of the study findings. In this study, we had difficulties when asking the respondents, most of whom had little education, to recall the names of pesticides and fertilizers that they used and make some calculations and estimations on the quantity of pesticides, fertilizers used per unit of land, etc. As a result, the information collected might not be totally correct.

11. In this study, we could only make comparisons between revenues from tobacco farming and that of other sources. The comparisons of revenues from different crops were not possible because we could not break down the figures on revenues from maize, rice, manioc, etc.
12. From the results of this study the following main conclusions were highlighted:
13. This study indicated that tobacco farmers were not wealthier than the non-tobacco farmers. In fact, tobacco farming did not bring much benefit to the farmers. The benefit the farmers could get would have been much higher if they had done something else or worked for someone else instead of investing in tobacco farming. However, an issue of concern here is the fact that tobacco farmers did not know what to do besides tobacco farming. Government should take initiatives and that alternatives should be explored to replace tobacco farming.
  - The tobacco market place was not stable and the farmers did not have real bargaining power and this could worsen the tobacco farmer's livelihood.
  - Tobacco farming had harmful effects on farmers' health and the environment.
  - Child and woman labor was widespread and essential in all stages of tobacco farming which raised important issues related to gender equality, social and health impacts of tobacco growing on these vulnerable groups.
13. Vietnam is still in the early stages of its battle against tobacco use. The findings from this study provided valuable and timely evidence that could be used to increase public awareness as well as develop and implement appropriate responses to the harmful effects of tobacco growing. To be effective, several proposals with policy implications were suggested and should be considered:

- Promote awareness about the social, environmental and health effects of tobacco farming with the aim to influence local governments and the communities to initiate and support policy changes..
- Support from policymakers at various levels is urgently needed to provide resources for examination of opportunities for short and long-term strategies for economic diversification in tobacco dependent communities, with the necessary funds going directly towards building alternative infrastructures for food, livestock, collection and distribution processes, for potential lost income, job development, rural and agricultural development, compensation for lower land values and penalties assessed on tobacco companies which renege on purchasing intentions. Evidence clearly showed that farmers involved in tobacco cultivation also faced health hazards and if they could be persuaded to opt for sowing alternative crops, it would save them from a host of ailments caused by tobacco.
- Seek suggestions from tobacco farmers about the prospects of cultivating alternative crops and the incentives they might want from the government in exchange for dropping the cultivation of tobacco. Support would be needed for facilitating the growth of alternative crops and improving access to markets for other crops.
- Expand the provision of economic assistance and livelihood projects to tobacco-growing families, especially as a way of preventing their victimization from loan sharks and unscrupulous traders.
- Provide communities and farmers with targeted technical assistance and encouraging farmers to apply the integrated farming system approach, which enjoins them to plant a diverse variety of crops at different times in the year, in order to offset the dire effects of losses from mono-cropping.
- Conduct broader and deeper studies on this issue using prospective approach to establish the long-term health and environmental effects of tobacco cultivation. This would require the cooperation of occupational epidemiologists and agricultural scientists. Agricultural interests must be partners in the design and implementation of these studies. This would help to ensure successful completion and the use of research findings.

## REFERENCES

1. Campaign for Tobacco Free Kids. Golden Leaf Barren Harvest, the Costs of Tobacco Farming; 2001.
2. Mackay J, Eriksen M. The Tobacco Atlas. Geneva: World Health Organization; 2005.
3. Kinh HV, Bales S. Tobacco in Viet Nam: The Industry, Demand, Control Policies and Employment. 2002.
4. Ballard T *et. al.* Green Tobacco Sickness: Occupational Nicotine Poisoning in Tobacco Workers. Archives of Environmental Health. 1995; 50:384-9.
5. Southeast Center Studies Ways to Prevent Green Tobacco Sickness. NIOSH Agricultural Health & Safety Center News; 1996.
6. Arcury TA *et. al.* High Levels of Transdermal Nicotine Exposure Produce Green Tobacco Sickness in Latino Farm Workers. Nicotine & Tobacco Research. 2003; 5:315-21.
7. Cox C. 1,3—Dichloropropene. Journal of Pesticide Reform. 1992.
8. Cox C. Chlorpyrifos Factsheet, Part 2. Journal of Pesticide Reform. 1995.
9. Geist HJ. Global Assessment of Deforestation Related to Tobacco Farming. Tobacco Control. 1999; 8(18-28).
10. Geist HJ. Soil Mining and Societal Responses. In: Lohnert Band Geist H eds. Coping with Changing Environments: Ashgate Publications; 1999.
11. Vietnam Prime Minister's Office. Decision 77/2002/QD-TTg: Ratification of Program of Prevention and Control of Certain Non-communicable Diseases for the Period 2002–2010.; 2002.
12. Viet Nam Prime Minister's Office. Government Resolution No.12/2000/NQ-CP on National Tobacco Control Policy 2000 - 2010. 2000.
13. Creswell JW, Clark VLP, Gutmann ML, Hanson WE. Advanced Mixed Methods Research Designs In: Tashakkori A, Teddlie C, editors. Handbook of Mixed Methods in Social & Behavioral Research: Sage Publications; 2003.
14. University of London. Sample size calculation [cited 2006 30/11]; Available from: [http://www.sgul.ac.uk/depts/chs/chs\\_research/stat\\_guide/size.cfm](http://www.sgul.ac.uk/depts/chs/chs_research/stat_guide/size.cfm)
15. Strauss A, Corbin J. Basics of Qualitative Research: Grounded Theory Procedure and Techniques: Thousand Oaks, CA: Sage; 1998.
16. Morse J, Field P. Nursing research. The Application of Qualitative Approaches Cheltenham, UK: Stanley Thornes; 1996.



17. Pallant J. SPSS Survival Manual: A Step by Step Guide to Data Analysis Using SPSS: Allen & Unwin; 2004.
18. Thang HD. Investment in Planting Tobacco in Vietnam. 2003.
19. Ministry of Planning and Investment. Situation of Cigarette Trading in Vietnam 1999-2000. 2000.
20. P.R.Panchamukhi. Agricultural Diversification as a Tool of Tobacco Control. The WHO International Conference on Global Tobacco Control Law: Towards a WHO Framework Convention on Tobacco Control. 2000.
21. Vinataba. Tobacco Cultivation in Vietnam. 2003.
22. Ministry of Natural Resource and Environment. Tobacco and Environment. 2006.
23. Mangora MM. Ecological Impact of Tobacco Farming in Miombo Woodlands of Urambo District, Tanzania. African Journal of Ecology. 2005; 43:385-91.
24. Trung V. Tobacco Planting and Related Problems. Ministry of Natural Resource and Environment. 2003.25. World Health Organization. Tobacco Increases the Poverty of Countries. 2000.
26. McBride JS, Altman DG, Klein M, White W. Green Tobacco Sickness. Tobacco Control. 1998; 7:294-8.
27. Parikh JR, Gokani VN, Kulkarni PK, Shah AR, Saiyed HN. Acute and Chronic Health Effects Due to Green Tobacco Exposure in Agricultural Workers. American Journal of Industrial Medicine. 2005; 47:494-9.
28. Arcury TA, Quandt SA, JS P. Predictors of Incidence and Prevalence of Green Tobacco Sickness Among Latino Farm Workers in North Carolina, USA. Journal of Epidemiology Community Health. 2001; 55:818-24.
29. Muwanga-Bayego H. Tobacco Growing in Uganda: The Environment and Women Pay the Price. Tobacco Control. 1994;3:255-6.
30. Torres AT, Cruz MG, Villanueva MM, Selva EVC, Leones CA, Budac MT. Rapid Appraisal of Child Labor in the Tobacco Industry: Case Study in Two ILOCOS Provinces 2002.
31. WHO. Tobacco & Health in the Developing World. 2003.

# APPENDICES



**3. During the past six months, have you ever had the following symptoms? If yes, how often have those symptoms occurred? (Interviewer circles the appropriate answers)**

<b>Symptoms</b>	<b>Never</b>	<b>Rarely</b>	<b>Sometimes</b>	<b>Frequently</b>	<b>Continuously</b>
1. Tiredness/weakness	1	2	3	4	5
2. Nausea	1	2	3	4	5
3. Vomiting	1	2	3	4	5
4. Dizziness	1	2	3	4	5
5. Headache	1	2	3	4	5
6. Abdominal pain	1	2	3	4	5
7. Insomnia	1	2	3	4	5
8. Difficulty breathing/shortness of breath	1	2	3	4	5
9. Increase perspiration/sweating	1	2	3	4	5
10. Chill	1	2	3	4	5
11. Heart rate	1	2	3	4	5
12. Pallor	1	2	3	4	5
13. Increase salivation	1	2	3	4	5
14. Whole body dull pain	1	2	3	4	5
15. Poor appetite	1	2	3	4	5
16. Itchy, rashing	1	2	3	4	5

**4. When do those symptoms often occur?**

- |                         |                             |
|-------------------------|-----------------------------|
| 1. Seeding and planting | 5. Storing                  |
| 2. Taking care          | 6. After pesticide spraying |
| 3. Harvesting           | 7. Other (specify):.....    |
| 4. Curing, processing   |                             |



## QUESTIONNAIRE FOR HOUSEHOLD INTERVIEW

(Interview of head of the household)

<i>Province: 1. Dong Nai 2. Thai Nguyen</i>	<i>District: 1. Cam My 2. Vo Nhai</i>	<i>Commune: 1. Xuan Dong 2. Xuan Tay 3. Lau Thuong 4. Vo Thuong</i>
<i>Village:</i>	<i>Household ID:</i>	
<i>Full name of household head:</i>		<i>Birth year of household head:</i>

### I. GENERAL INFORMATION OF THE HOUSEHOLD

1. Number of household members in your family (those living and having meals together in the last months).
2. Please provide detailed information of each member in your household (*Circle number in personal ID column as guideline under this table*).

Personal ID	Member	Age (year of birth)	Sex	Ethnicity	Educational level	Main occupation during the last 12 months	Illness during 4 weeks prior to the interview	Chronic disease
1	householder = 1							
2								
3								
4								
5								
6								

<b>7</b>								
<b>8</b>								
<b>9</b>								
<b>10</b>								

**Relationship code with household head:**

1. Household head    2. Wife, husband    3. Parents    4. Children    5. Khác

**Sex:**            1. Male                            2. Female

**Ethnicity:**    1. Kinh                            2. Others

**Educational level:**

- |                                   |  |                              |
|-----------------------------------|--|------------------------------|
| 1. No education                   | 4. Finished secondary school             | 7. Finished university level |
| 2. Not yet finished primary level | 5. Finished high school                  | 8. Post graduate level       |
| 3. Finished primary level         | 6. Finished professional secondary level |                              |

**Occupational code:**

- |                     |                           |             |
|---------------------|---------------------------|-------------|
| 1. Farmer           | 5. Construction worker    | 9. Retired  |
| 2. Government staff | 6. Handicraft man         | 10. Jobless |
| 3. Businessman      | 7. Pupils, students       | 11. Worker  |
| 4. Wood worker      | 8. Housewife/househusband | 12. Others  |

**Illness code:**            1. Yes                            2. No

**Chronic disease code:**    1. Yes                            2. No

**3. Does your family have any of the following items? (Interviewer asks and checks; interviewer does observation and interview)**

- |                                     |                               |                                 |
|-------------------------------------|-------------------------------|---------------------------------|
| 1. <i>Car/truck</i>                 | 6. <i>Fridge</i>              | 11. <i>Electric generator</i>   |
| 2. <i>Motoicycle</i>                | 7. <i>Air-conditioner</i>     | 12. <i>Cow/ buffalo</i>         |
| 3. <i>Television</i>                | 8. <i>Heater</i>              | 13. <i>Agricultural machine</i> |
| 4. <i>Video<br/>player(VCD/DVD)</i> | 9. <i>Washing<br/>machine</i> |                                 |
| 5. <i>Radio cassette</i>            | 10. <i>Truck, motorboat</i>   |                                 |

**4. What kind is your house? (Interviewer observes)**

- |                                    |                                |                            |
|------------------------------------|--------------------------------|----------------------------|
| 1. <i>Cottage</i>                  | 4. <i>More than two levels</i> | 7. <i>Others (specify)</i> |
| 2. <i>Brick, zinc roof</i>         | 5. <i>Makeshift wood house</i> |                            |
| 3. <i>Concrete roof, one level</i> | 6. <i>Strong wood house</i>    |                            |

**5. Total living area of your home (yard and garden not included).....sq. mt.**

**6. Main water source used for drinking and cooking? (Maximum 2 choices)**

- |                         |                               |                            |
|-------------------------|-------------------------------|----------------------------|
| 1. <i>Rain water</i>    | 4. <i>Lake/pond</i>           | 6. <i>Others (specify)</i> |
| 2. <i>Dug water</i>     | 5. <i>Stream/River</i>        |                            |
| 3. <i>Drilled water</i> | 6. <i>Water from mountain</i> |                            |



**7. Type of latrine?**

- |                                   |                          |                                       |
|-----------------------------------|--------------------------|---------------------------------------|
| 1. <i>Single vaulted latrine</i>  | 4. <i>“Tham” latrine</i> | 8. <i>Share with home-bred animal</i> |
| 2. <i>Double vaulted latrine</i>  | 5. <i>“Cau” latrine</i>  | 9. <i>Others (specify)</i>            |
| 3. <i>Septic/semi septic tank</i> | 6. <i>“Meo” latrine</i>  | 10. <i>No latrine</i>                 |

**8. What is the household income of your family in the last year?**

<b>Sources of income</b>	<b>Amount (VND)</b>
1. Animal breeding, fish pond	
2. Tobacco farming and production	
3. Other crops	
4. Fruit trees	
5. Industrial crops	
6. Forestry	
7. Handicraft	
8. Services/daily work	
9. Outside/relative support	
10. Salary/Allowance	
11. Trading	
12. Others	

**9. Household economic status classified by the local authority (Communal People Committee)?**

- |                     |                         |   |
|---------------------|-------------------------|---|
| 1. <i>Very poor</i> | 3. <i>Average</i>       | 5. <i>Rich</i>                          |
| 2. <i>Poor</i>      | 4. <i>Upper average</i> | 6. <i>Not yet classified/don't know</i> |

**11. Household economic status according to the interviewee?**

- |                     |                         |                      |
|---------------------|-------------------------|----------------------|
| 1. <i>Very poor</i> | 3. <i>Average</i>       | 5. <i>Rich</i>       |
| 2. <i>Poor</i>      | 4. <i>Upper average</i> | 6. <i>Don't know</i> |

**II. FARMING ACTIVITIES**

**12. Total land area currently used for farming by your family (including rented areas).....perch**

**13. Do you currently do tobacco farming?**

- 1. *Yes*
- 2. *No* → Go to section IV,V, VI

**III. TOBACCO FARMING**

**14. How long have you been doing tobacco farming?**

**15. If you do tobacco farming, which of the following activities are done by your family? (Multi choices)**

- 1. *Planting, seeding*
- 2. *Taking care*
- 3. *Harvesting*
- 4. *Curing*
- 5. *Storing*
- 6. *Others*

**16. How many harvest times per year?**

- 1. *Once per year*
- 1. *Twice per year*
- 3. *Continuously*
- 4. *Others (specify)*

**17. Total land area currently used for tobacco farming by your family (including rented areas).....perch**

**18. Please list all machines that you have and used for tobacco farming and production?**

<b>Machines</b>	<b>Purchase price (VND)</b>	<b>Purchase year</b>	<b>Quantity</b>	<b>Amount of time used for one year farming production (month)</b>	<b>Amount of time used for tobacco production (month)</b>

**19. Average amount of money spent on tobacco farming on 1 perch in one harvest (estimate and not including labor cost)?**

*Interviewer reads aloud cost items in succession*

Items	Amount (‘000VND/perch)
<b>Production cost</b>	
1. Expenses for preparing soil	
2. Expenses for seeds	
3. Expenses for irrigation	
4. Expenses for fertilizers	
5. Expenses for pesticides	
6. Expenses for transportation	
7. Expenses for storing, shelf (if any)	
8. Renting land fees	
9. Expenses for curing	
10. Expenses for agricultural plastic film, packing materials	
11. Others (specify)	
<b>Other costs</b>	
1. Tax, all kinds	
2. Interest on borrowing current funds (if any)	
3. Insurance	
4. Others (specify)	

**20. Labor cost for cultivating and processing tobacco on 1 tobacco perch in 1 harvest ( including employing expense and self-doing cost)**

*Interviewer reads aloud cost items in succession*

<b>Activities</b>	<b>Number of person-days (number of person X number of person-day of each person)</b>	<b>Amount of VND/person day</b>	<b>Total expense</b>
1. Preparing soil			
2. Seeding, planting			
3. Taking care (irrigation, etc)			
4. Harvesting			
5. Processing, curing			
6. Storing			
7. Others (specify)			

**21. Please list all types and amount of pesticides and fertilizers that you have used for 1 perch of tobacco in 1 harvest the last year.**

*(Please clearly provide unit of measurement, for example: number of ml or gram)*

<b>Type of pesticide and fertilizer</b>	<b>Amount used for 1 perch</b>
<b><i>Pesticide</i></b>	
<b><i>1.</i></b>	
<b><i>2.</i></b>	
<b><i>3.</i></b>	
<b><i>Fertilizer</i></b>	
<b><i>1.</i></b>	
<b><i>2.</i></b>	
<b><i>3.</i></b>	

**22. Do you have debts because of tobacco farming?**

*1. Yes*

*2. No*

**23. Your satisfaction regarding your current tobacco farming**

1. *Satisfied*                      2. *Wavering*                      3. *Not satisfied*

**24. Where do you often store tobacco? (Khoanh tròn vào ô phù hợp)**

<i>Places</i>	<i>Before curing</i>	<i>After curing</i>
1. Inside the house, near living rooms	1	2
2. In the store room, kitchen – near living rooms	1	2
3. In separate place – far from living rooms	1	2
4. Others (specify): .....	1	2

**25. Where do you often do tobacco curing?**

1. *No, we don't do curing (→ Go to question 26)*
2. *At home*
2. *Other place, owned by our family*
3. *Rent other place*
4. *Others (specify):.....*

**26. What kind of fuel do you often use for tobacco curing? What are the sources of those fuels? (Circle the appropriate answers)**

<b>Fuel</b>	<b>Amount used in the last harvest</b>	<b>Sources</b>				
		<b>From forest</b>	<b>Bought</b>	<b>Home garden</b>	<b>Provided</b>	<b>Other (specify)</b>
1. Coal		1	2	3	4	5
2. Firewood		1	2	3	4	5
3. Grass		1	2	3	4	5
4. Electric power		1	2	3	4	5
5. Gas		1	2	3	4	5
6. Sunlight		1	2	3	4	5
7. Others (specify):.....		1	2	3	4	5

**27. Where/to which agency do you often sell tobacco?**

1. *Contracted tobacco company*
2. *Free market by negotiating*
3. *It depends on each period*
4. *Others (specify): .....*

**28. Who decide the price of tobacco?**

1. *Buyer*
2. *Seller*
3. *Agreement between seller and buyer*

**29. The main reason your family plant tobacco?**

1. *Official request from authority or/and tobacco companies (if yes→ Go to question 30)*
2. *The return is more than those of other agricultural products (→ Go to question 31)*
3. *Don't know/can't plant other crops(→ Go to question 31)*
4. *Do tobacco farming increases income (Revenue from tobacco farming is extra income to family)*
5. *The support and encouragement from government and/or tobacco company (If yes, Go to question 31)*
6. *Easy to buy tobacco products (→ Go to question 31)*

**30. If you plant tobacco due to official request, who requested you to plant tobacco?**

1. *Communal local authority*
2. *District, provincial local authority*
3. *Tobacco company*
4. *Others (specify).....*

**31. If you got support and encouragement, what are they?**

(Multi choices, circle the answers “Yes” or “No”)

<i>Measures</i>	<i>Yes</i>	<i>No</i>
1. Interest-free loan	1	2
2. Low interest loan	1	2
3. Paying some of the purchasing money in advance	1	2
5. Rewarded fertilizer	1	2

6. Rewarded pesticide	1	2
5. Provided free technical guide	1	2
6. Provided free seed	1	2
7. A subsidy on irrigation fee	1	2
8. Have right to buy stocks of tobacco companies	1	2
9. Market assurance for tobacco products	1	2
10. Others (specify).....	1	2

**32. What is your plan if you were asked to plant less tobacco or not to plant tobacco any more?**

1. *Go out to work*
2. *Plant other crops*
3. *Others (specify): .....*

**33. Besides tobacco farming, which other crops are you cultivating? (Multi choices)**

1. *Maize (If any → Continue to answer section IV)*
2. *Rice (If any → Go to section V)*
3. *Others (specify).....(If any → Go to section VI)*

**IV. MAIZE FARMING**

**34. How many harvests per year?**

1. *Once a year*
2. *Twice per year*
3. *Continuously*
4. *Others (specify)*

**35. Total land area currently used for growing maize by your family (including renting areas).....perch**

36. Please list all machines that you have used for doing maize farming.

<b>Machines</b>	<b>Purchase price (VND)</b>	<b>Purchase year</b>	<b>Quantity</b>	<b>Amount of time used for 1 year farming production (month)</b>	<b>Amount of time used for maize production (month)</b>

37. Average amount of money spent on maize farming on 1 perch in one harvest (estimate and not including labor cost)?

*Interviewer reads aloud cost items in succession*

<b>Items</b>	<b>Amount ('000VND/ perch) Maize</b>
<b>Production cost</b>	
1. Expenses for preparing soil	
2. Expenses for seeds	
3. Expenses for irrigation	
4. Expenses for fertilizer	
5. Expenses for pesticides	
6. Expenses for transportation	
7. Expenses for storing, shelf (if any)	
8. Fees for renting land	
9. Expenses of curing	
10. Expenses for agricultural plastic film, packing materials	
11. Others (specify)	
<b>Other costs</b>	
1. Tax, all kinds	
2. Interest on borrowing current funds (if any)	
3. Insurance	



**38. Labor cost for cultivating and processing tobacco on 1 Maize perch in 1 harvest (including employing expense and self-doing cost?)**

*Interviewer reads aloud cost items in succession*

<i>Activities</i>	<i>Number of person-days (number of person X number of person-day of each person)</i>	<i>Amount of VND/person day</i>	<i>Total expense</i>
1. Preparing soil			
2. Seeding, planting			
3. Taking care (irrigation, etc)			
4. Harvesting			
5. Processing, curing			
6. Storing			
7. Others (specify)			

**39. Please list all types and amount of pesticides and fertilizers that you have used for 1 maize perch in 1 harvest in the last year**

*(Please clearly provide unit of measurement, for example: number of ml or gram)*

<b>Type of pesticide and fertilizer</b>	<b>Amount used for 1 perch</b>
<i>Pesticide</i>	
1.	
2.	
3.	
<i>Fertilizer</i>	
4.	
5.	
6.	

**40. Do you have debts because of maize farming?**

1. *Yes*

2. *No*



<b>Items</b>	<b>Amount (‘000VND/ perch) RICE</b>
5. Expenses for pesticides	
6. Expenses for transportation	
7. Expenses for storing, shelf (if any)	
8. Renting land fees	
9. Expenses for curing	
10. Expenses for agricultural plastic film, packing materials	
11. Others (specify)	
<b>Other costs</b>	
1. Tax, all kinds	
2. Interest on borrowing current funds (if any)	
3. Insurance	

**46. Labor cost for cultivating and processing on 1 RICE perch in 1 harvest (including employing expense and self-doing cost?)**

*Interviewer reads aloud cost items in succession*

<b>Activities</b>	<b>Number of person-days (number of person X number of person-day of each person)</b>	<b>Amount of VND/person day</b>	<b>Total expense</b>
1. Preparing soil			
2. Seeding, planting			
3. Taking care (irrigation, etc)			
4. Harvesting			
5. Processing, curing			
6. Storing			
7. Others (specify)			

**47. Please list all types and amount of pesticides and fertilizers that you have used for 1 RICE perch in 1 harvest in the last year.**

*(Please clearly provide unit of measurement, for example: number of ml or gram)*

Type of pesticide and fertilizer	Amount used for 1 perch
<i>Pesticide</i>	
1.	
2.	
3.	
<i>Fertilizer</i>	
1.	
2.	
3.	

**48. Do you have debts because of RICE farming?**

1. *Yes*

2. *No*

**49. Your satisfaction of your current RICE farming**

1. *Satisfied*

2. *Wavering*

3. *Not satisfied*

**VI. OTHER CROPS FARMING**

**50. How many harvests per year?**

1. *Once a year*

2. *Twice per year*

3. *Continuously*

4. *Others (specify)*

**51. Total land area currently used by your family for growing OTHER CROPS**

**(including rented areas).....perch**

**52. Please list all machines that you have and have used for growing OTHER CROPS?**

<b>Machines</b>	<b>Purchase price (VND)</b>	<b>Purchase year</b>	<b>Quantity</b>	<b>Amount of time used for 1 year farming production (month)</b>	<b>Amount time used for other crops production (month)</b>

**53. Average amount of money spent on farming OTHER CROPS on 1 perch in one harvest (estimated and not including labor cost)?**

*Interviewer reads aloud cost items in succession*

<b>Items</b>	<b>Amount ('000VND/ perch) Other crops</b>
<b>Production cost</b>	
1. Expenses of preparing soil	
2. Expenses for seeds	
3. Expenses for irrigation	
4. Expenses for fertilizers	
5. Expenses for pesticides	
6. Expenses for transportation	
7. Expenses for storing, shelf (if any)	
8. Renting land fees	
9. Expenses for curing	
10. Expenses for agricultural plastic film, packing materials	
11. Others (specify)	

Items	Amount (‘000VND/ perch) Other crops
<b>Other costs</b>	
1. Tax, all kinds	
2. Interest on borrowing current funds (if any)	
3. Insurance	

**54. Labor cost for cultivating and processing of 1 other crop perch in 1 harvest (including employing expense and self-doing cost?)**

*Interviewer reads aloud cost items in succession*

<i>Activities</i>	<i>Number of person-days (number of person X number of person-day of each person)</i>	<i>Amount of VND/person day</i>	<i>Total expense</i>
1. Preparing soil			
2. Seeding, planting			
3. Taking care (irrigation, etc)			
4. Harvesting			
5. Processing, curing			
6. Storing			
7. Others (specify)			

**55. Please list all types and amount of pesticides and fertilizers that you have used for 1 other crop perch in 1 harvest in the last year**

*(Please clearly provide unit of measurement, for example: number of ml or gram)*

Type of pesticide and fertilizer	Amount used for 1 perch
<i>Pesticide</i>	
<i>1.</i>	
<i>2.</i>	
<i>3.</i>	

Type of pesticide and fertilizer	Amount used for 1 perch
<i>Fertilizer</i>	
<i>1.</i>	
<i>2.</i>	
<i>3.</i>	

**56. Do you have debts because of OTHER CROPS farming?**

*1. Yes*

*2. No*

**57. Your satisfaction of your current other crops farming**

*1. Satisfied*

*2. Wavering*

*3. Not satisfied*

Date of interview:

...../...../.....

Supervision date:

...../...../.....

Interviewer: .....

Field supervisor:

.....

Interviewer's comment:

Nhận xét của giám sát viên:

## **APPENDIX 2: QUALITATIVE GUIDELINE**

### **Guideline for in-depth interview (IDI) and focus group discussion (FGD)**

#### **Guideline for in-depth interview with commune leader and head of commune health center**

- Researchers should confirm the date, time and place of the interview in advance.
- The researchers should prepare a recorder and a notebook and pen for note-taking.
- The researchers should introduce themselves. Respondents should be briefed again on the aims of the research and what to expect in the discussion.
- Informed consent should be sought from respondents.
- Respondents will be reminded that everything they say should be kept confidential and will be reported anonymously.

#### **Discussion points**

1. To what extent tobacco production/other crop production and other income generating activities contribute to family and commune's economy. Why does your commune engage in tobacco farming and why not?
2. How much have commune's social and economic status improved since engaging in tobacco farming/other income generating activities; particularly on finances/number of poor households? Environment?
3. Who control tobacco leaves prices and quality/other crop products? And why? Do farmers have any bargaining power? And why?
4. How stable are the prices of farming products – i.e. price guarantee? And why?
5. How stable is the demand? How does it affect the livelihood of farmers?
6. Who are the buyers? Can the farmers select the buyers and why?
7. Do the farmers own the land and other relevant infrastructure and machineries for farming and why?
8. What is your opinion regarding pesticides and fertilizers consumed for the cultivation of tobacco in comparison with other crops? How do they impact on community health and environment?
9. What is the involvement of child labor in the cultivation of tobacco vs. other crops? How does that impact their educational attainment, health?
10. What is the involvement of woman labor in the cultivation of tobacco vs. other crops? How does that impact their livelihood, health?
11. Can you provide some general comments on the health situation (general health status, access to health services, health problem pattern in your commune) (This question is very important for collecting information from head of commune health center therefore it will be asked at the beginning of the interview)
12. Any queries that respondents have?



### **Guideline for focus group discussion with farmers**

- The focus group discussion should be conducted in a neutral setting and the set-up should be relatively informal (for example, with chairs in a circle to encourage interaction, in one participant's house or at the community meeting hall, or class room in this community)
- The focus group facilitators should ensure that they have the necessary resources, including a recorder, a notebook to record their observations and refreshments for the participants.
- The facilitators should introduce themselves to the group. Participants should be briefed again on the aims of the research and what to expect in the discussion.
- Informed consent should be sought from all participants.
- Participants will be reminded that everything they say within the group should be kept confidential and will be reported anonymously.

### **Discussion points**

1. To what extent tobacco production/other crop production and other income generating activities contribute to family's economy. Why do they engage in tobacco farming and why not?
2. How much have their livelihood improved since engaging in tobacco farming/other income generating activities; particularly on finances/ level of debt? Environment?
3. Who control tobacco leaves prices and quality/other crop products? And why? Do farmers have any bargaining power? And why?
4. How stable are the prices of farming products – i.e. price guarantee? And why?
5. How stable is the demand? How does it affect the livelihood of farmers?
6. Who are the buyers? Can the farmers select the buyers and why?
7. Do the farmers own the land and other relevant infrastructure and machineries for farming and why?
8. What is the farmers' opinion regarding pesticides and fertilizers consumed for cultivation of tobacco in comparison with other crops? How do they impact on their health and environment?
9. What is the involvement of child labor in the cultivation of tobacco vs. other crops? How does that impact their educational attainment, health?
10. What is the involvement of woman labor in the cultivation of tobacco vs. other crops? How does that impact their livelihood, health?
11. Any queries that participants have?



---

## About SEATCA

The Southeast Asia Tobacco Control Alliance (SEATCA) works closely with key partners in ASEAN member countries to generate local evidence through research programs, to enhance local capacity through advocacy fellowship program, and to be catalyst in policy development through regional forums and in-country networking. By adopting a regional policy advocacy mission, it has supported member countries to ratify and implement the WHO Framework Convention on Tobacco Control (FCTC)

## Contact persons:

**Ms. Bungon Ritthiphakdee: SEATCA Director**

Email: [bungon@seatca.org](mailto:bungon@seatca.org)

**Ms. Menchi G. Velasco: SEATCA Research Program Manager**

Email: [menchi@seatca.org](mailto:menchi@seatca.org); [menchi55@yahoo.com](mailto:menchi55@yahoo.com)

Southeast Asia Tobacco Control Alliance (SEATCA)

Address: Thakolsuk Apartment Room 2B, 115 Thoddamri Rd., Nakornchaisri  
Dusit, Bangkok 10300, THAILAND

Tel./Fax: +662 241 0082

Website: <http://www.seatca.org>

---