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**NEEDS OF TEA GROWERS FOR PARTICIPATING IN TEA  
PRODUCTION INSURANCE: A CASE STUDY IN PHU THO  
PROVINCE, VIETNAM**

Hai Ninh NGUYEN THI<sup>1</sup>, Song NGUYEN VAN<sup>2</sup>, Philippe LEBAILLY

<sup>1</sup>Department of Economics and Rural Development, University of Liege, Belgium

<sup>2</sup>Department of Resources and Environmental Economics, Vietnam National University of  
Agriculture, Vietnam

\*Corresponding author: haininh.hua@gmail.com

**ABSTRACT**

The research has evaluated the situation of tea production of tea growers in Phu Tho Province, Vietnam. Average tea plantation area among the largest group of households is 0.61 ha. In production, the types of risks that tea growers encounter include: unfavorable weather (33.4%), diseases (13.2%), insects and worms (2.3%), capital (0.3%) and price which is the most major risk (50.8%). The survey of 1,000 tea growers identified that 46.7% of the households are in need to participate in tea production insurance. The average willingness to pay was estimated to be 2,407.07 (thousand VND/ha/year). If the agricultural program is successfully implemented in the province, it is estimated to have a total agricultural insurance fund of 34-35 billion VND/year. The survey results show that gender, education level, tea growing area and location are factors that affect the level of willingness to pay for agricultural insurance for tea trees. There are four solutions which are proposed to enhance the participation of tea growers in agricultural insurance for tea: (1) Development of an insurance product for the production of fresh tea leaves for easier access from farmers; (2) Active communication on agricultural insurance policy to local authorities, farmers' union, agricultural expansion stations and especially the farmers; (3) Close collaboration between local authorities and enterprises in the review on current mechanisms and policies to timely propose adjustments and supplements to meet the needs of farmers on agricultural insurance; (4) Strengthening coordination between the State, insurance companies, credit and financial institutions and farmers.

**Keywords:** *agricultural insurance, tea growing households, tea production.*

**INTRODUCTION**

Phu Tho is a midland province in the north of Vietnam which suitable terrain and climate for tea trees. Recognizing this strength, since 2000, the People's Committee of Phu Tho Province has put tea tree into the key agricultural programs of the

province. Therefore, Phu Tho tea trees play an increasingly important role in the development of local agriculture.

Currently, tea is the main export items of Phu Tho province. In 2010, the province exported tea with worth of \$7.3 million; in 2011, the amount was increased to over \$13 million (Khuong, 2012). The tea sector has a significant contribution to job creation and income generation for people in many parts of the province. Except for households with small-scale and new production, most tea growing households have a stable income. With the purchase of VND 3,000-4,000/kg of fresh bud, households with a growing area of 1,000 to 5,000m<sup>2</sup> can have tens of millions dong of income; many households have become rich thanks to the tea tree (Hoan, 2011). Besides, the price of tea in recent years has been relatively stable, so the life of the tea growers has been firmly guaranteed. However, tea production in Vietnam in general and in Phu Tho province in particular in recent years have been influenced by many factors such as natural disasters, disease outbreaks and market prices which have negative impacts on the productivity, output and income. Therefore, farmers need a cure from agricultural insurance to limit the damage. In Vietnam, the pilot agricultural insurance under Decision No. 315/QĐ-TTg dated 01/3/2011 by the Prime Minister was implemented. As of 30/04/2013, the pilot of agricultural insurance was been implemented throughout the country with the participation of 234,235 households and the contract insurance value for crops, livestock, fisheries of VND 5,437 billion; total original premium revenue reached over VND 303 billion (Dinh, 2014). The types of agricultural insurance are mainly for rice, cattle, pigs, poultry and seafood. Insurance for tea trees has not been reported in any locality in the country. Besides its new formation and development, agricultural insurance is facing difficulties and obstacles in its pilot implementation: (i) Agricultural insurance is a new insurance type with complexity; there has not been much experience in its implementation; (ii) wide range of insured products and large insured geographical coverage make it difficult for the control, risk limit, monitoring processes for procedures, production standards, farming, aquaculture; assessment, identification of diseases, epidemics and loss; (iii) natural disasters and epidemics sometimes cause huge financial losses exceeding the financial capacity of the insurance business; (iv) direction and communication in some localities are still confusing; implementation has been carried out in some localities but the number of contracts is still limited; (v) a number of farmers, agricultural organizations have participated in agricultural insurance as an exploratory activity (Son, 2009). Due to the important role of tea tree in economic development of rural households in Phu Tho province and the contribution of the agricultural insurance in minimizing damage to agricultural production, research: *"Needs of tea growers for participating in tea production insurance: A case study in PhuTho province, Vietnam"* is urgently needed to help tea farmers reduce the damage caused by risks in the production process.

## MATERIAL AND METHODS

In Phu Tho province in Vietnam, Thanh Son, Yen Lap, Doan Hung and Thanh Ba are the four districts having largest area of tea and most developed tea production. Therefore, between 2014-2015 the research selected 1,000 households in the 4 districts to conduct survey on their needs for agricultural insurance participation through prepared questionnaires. The questionnaires consists of 40 questions focusing on households' characteristics and their tea production activities. In particular, in order to collect information about the needs for agricultural insurance participation of tea growers, the research used Contingent Valuation method (CVM) which allows the survey on needs and requirement assessment and analysis of the basic factors affecting needs and requirement of tea growers for agricultural insurance (Dung, 2011). The basis of this randomized evaluation method is to study the willingness to pay (WTP) of customers for the change of the insurance policy. In addition, the research also conducted in-depth interviews of 50 managers at provincial, district and commune level in the research area; 3 – 5 persons for each level were interviewed.

After having been aggregated and analyzed using descriptive statistical and comparative statistical methods, the data is used in the regression model to provide more clearly factors affecting the level of tea growers' willingness to pay for agricultural insurance. The model is described as follows:

$$WTP = S_0 + S_1X_1 + S_2X_2 + \dots + S_{12}X_{12} + u$$

Dependent variable WTP is willingness to pay of each tea grower for agricultural insurance. Independent variable X represents the factors affecting the willingness to pay of tea growers including factors from within the tea growers as age, gender, education level, economic conditions, area, form of ownership, productivity of tea; and external factors such as level of risk encountered in the production of tea and tea growing localities.

## RESULTS AND DISCUSSION

### General situation of tea production of the surveyed households

Tea tree is a perennial plant; in production, tea tree needs a certain amount of care each year. Investment volume for tea tree (capital, labor, machinery for production) also depends on economic conditions, production scale of each household. In terms of investment, the capital investment in tea growing of households having less than 0.5 ha of area is the lowest with VND 12.83 million. Capital investment for tea growing of households is raised from two main sources of family budget or borrowings (usually from a relative or credit institutions in the locality). In terms of labor, tea growing can be considered as the main occupation of many households, the income of many families have to depend entirely on the tea gardens. Therefore, labors in tea growing are mainly family members. In addition to family labor, many households also hire extra workers during harvest, spraying, tea cutting time. In terms of risks encountered in the process of growing tea, it can be said that agricultural production is heavily dependent on natural conditions and weather, thus being very risky. For the tea tree, the harvest time is short (about 45

days/harvest) and there are several harvest during the year (starting from March to October, November), so the risks faced are greater with more serious damage. In recent years, the tea growers often face the risk of natural disasters, pests which cause decreased productivity and quality of tea leaves. In addition, the risks of input market price and capital also affect the productivity of tea. Among the five risks listed above, the risk of market price (including input prices and output prices) was considered as greatest impact by 50.8% of the households, followed by the risk of weather which was identified by 33.4% of the households. Risks related to pests, diseases were believed to reduce productivity and output by 15.5% of the households.

### **Needs for agricultural insurance for tea trees of surveyed households**

#### *The need for participation and the willingness to pay*

Survey data shows that 467 households, accounting for 46.7% of the surveyed households, are willing to participate in agricultural insurance. 533 households, accounting for 53.3%, do not have the needs for participating in agricultural insurance for tea trees with the most common reasons that they have no idea agricultural insurance for tea trees (100%) and that their small tea plantation area is not worth buying agricultural insurance (26.34%).

The findings on the willingness to pay to participate in agricultural insurance of the surveyed households are shown in Table 2. The aggregated data from CVM method show that 138 out of 467 households agree to participate at VND 1,350,000/ha/year, accounting for 29.55%. With participation fee of VND 2,025,000/ha/year and VND 2,700,000/ha/year, there are 101 and 97 households agreeing to buy, respectively. With higher fee of VND 3,375,000/ha/year, there are 86 households agreeing to participate (in total of 467 participating households), accounting for 18.42%. With highest participation fee of tea agricultural insurance of VND 4,025,000/ha/year, there are only 45 households participate. From here, we determine the average willingness to pay (average WTP) of the surveyed households according to the weighted average method: average WTP is 2,407.07 (thousand VND/ha/year).

Table 2. The level of willingness to pay to participate in tea agricultural insurance

WTP (1,000 VND/ha/year)	Demand for insurance with productivity index	
	Number of participants	Percentage (%)
1,350	138	29.55
2,025	101	21.63
2,700	97	20.77
3375	86	18.42
4025	45	9.64
Total	467	100.00

\*Source: Authors' own calculations from survey data in 2015

The demand curve in Figure 1 is in line with the law of supply and demand as other commodity markets. Demand on the willingness to pay also has tendency that the higher compensation rate of the agricultural insurance is, the less people accept. However, the chart shows that when the purchase prices of agricultural insurance is higher; there is not much change in the number of participants.

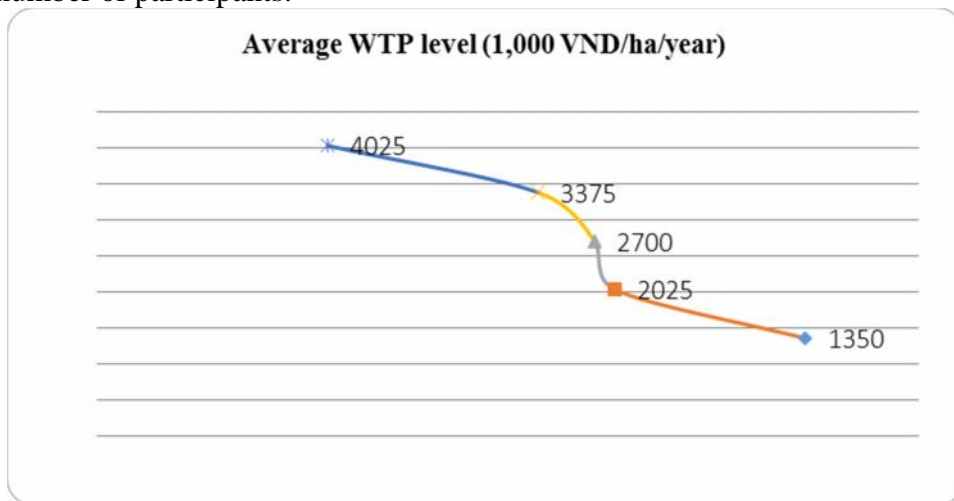


Figure 1. The level of average WTP for participation in agricultural insurance for tea trees

\*Source: Authors' own calculations from survey data in 2015.

The lowest and highest levels given by the people were VND 1,350 thousand/ha/crop and VND 4,025 thousand/ha/year, respectively. The reason for the large difference between these two values is that CVM is a random survey methodology; the level of the individual WTP is completely dependent on the awareness, knowledge and subjective opinion of the respondents on the agricultural insurance for tea tree. The high level was given by those with better knowledge and income while the lowest was given mainly by low-income people.

On this basis, the research can estimate the total insurance funds collected annually if agricultural insurance is successfully implemented in Phu Tho province: Total insurance fund is estimated to reach 34 to 35 (billion VND/year) based on the total productive tea growing area of 14,483.8 hectares in the province.

#### Needs for insurance evaluating agency

Through the data Table 3, we can see that the majority of households expect that when risk occurs it is necessary to have a combination of agricultural experts, local authorities and insurance agency to evaluate the loss of tea production. According to the households, it would be more accurate and more transparent in evaluation to do so and their rights and interests are better protected.

Table 3. Needs for co-agencies for loss evaluation

Agency	No. of household	Percentage (%)
Commune authority	33	7.07
Agricultural experts	5	1.07
Both	429	91.86
Total	467	100.00

\*Source: Authors' own calculations from survey data in 2015

When being interviewed, there were 91.86%, equivalent to 429 households out of a total of 467 households wishing to participate in tea production agricultural insurance, said that it was required for the participation of commune people's committee, district department of Agriculture and Rural Development or farmers' union in loss evaluation together with insurance agencies. There were 33 households, equivalent to 7.07%, said that only commune authority and the households were enough to evaluate loss when risk occurred.

#### *Needs for insurance payment forms*

Upon occurrence of risk, the interviewed households have different needs on how to compensate, some wanted to be compensated in cash, some wanted household supplies such as fertilizers, pesticides and other wanted to be paid back in tea seedlings in the case of death tea trees. Needs for compensation payment mechanisms are shown in Table 4.

Table 4. Needs for compensation forms of surveyed households

Forms of payment	Number (households)	Percentage (%)
Payment through the bank (card, account)	13	2.78
Payment in cash (direct payments)	378	80.94
Payment in fertilizer (direct payment)	49	10.49
Other forms (pesticides, seedlings ...)	27	5.78
Total	467	100.00

\*Source: Authors' own calculations from survey data in 2015

Data collected from the survey shows that the majority of producers wish to be compensated directly in cash (80.94%). When being asked about the reasons, these households said that they needed to receive compensation in cash to pay for the loans as investment in tea production or cover other expenses of their families. Generally, upon receipt of cash compensation, producers can use them in a flexible manner for many different purposes.

There was 10.49% equivalent to 49 out of 467 households agreed to participate in agricultural insurance with compensation in fertilizers. And only 5.78% of the households wanted to be compensated in other forms, such as pesticides, seedlings ... These are households wishing to receive compensation for investment to overcome the loss caused by risk. If the loss was caused by the risk of pests and diseases, they would like to get pesticide; if tea trees die, they want to get seedlings and fertilizer as they believe that the supplies (seedlings, fertilizers, pesticides) they

receive are evaluated by agricultural experts, therefore they would be better than those purchased by them.

*Needs for the State's support for agricultural insurance payment*

Table 5. Needs on the level of Government's support for agricultural insurance payment

Target group	Respondents (%)	Government regulations (%)
1. Poor households	100	100
2. Nearly poor households	93.33	90
3. Not poor and nearly poor households	67.87	60
4. Agricultural organizations	36.67	20

\*Source: Authors' own calculations from survey data in 2015

Currently, the Government has policies supporting farmers to participate in agricultural insurance. The Government supports 100% for poor households, 90% for nearly poor households, 60% for other households and 20% for agricultural organizations. The interviewees desired support levels as follows:

According to the survey on the time to pay agricultural insurance fee, the majority of households said that it should be paid on a quarterly basis (47.32% of the total households agreeing to participate in agricultural insurance for tea tree). This group believed that due to the change in the weather and diseases over time, the risks encountered in tea production is different for each season. Therefore, they want to participate mainly quarterly. Among the 467 households, 134 households (representing 28.69%) wish to participate in agricultural insurance for tea trees yearly which would be more reasonable. Yearly agricultural insurance payment would save time for purchasing and avoid cumbersome, complicated procedures. Payment could be done once a year. Besides the above opinions, there were 112 remaining households desiring to pay agricultural insurance fee monthly.

*Analysis of factors affecting the willingness to pay for agricultural insurance*

Table 6. Estimated results of factors affecting the level of WTP

Description	Coefficient	Value	Level of significance	P-value
Coefficient of freedom	0	-510.06	ns	0.767
Age	1	13.92	ns	0.385
Sex	2	15.43	**	0.023
Academic level	3	12.27	*	0.073
Economic conditions 1	4	652.29	**	0.041

Economic conditions 2	5	230.05	***	0.003
Tea growing area	6	1182.24	***	0,001
Ownership	7	480.27	ns	0.906
Location 1	8	40.53	*	0.068
Location 2	9	20.49	*	0.080
Location 3	10	-12.60	**	0.037
Tea productivity	11	127.57	NS	0.109
Risk level	12	73.99	NS	0.205

R<sup>2</sup>: 0.535 F: 6.39; Sig F: 5,55E-6

*\*Source: Authors' own calculations from survey data in 2015 and model running*

*\*\*\* Confidence 99%; \*\* Confidence 95%; \* Confidence 90%; Ns No statistical significance*

The analysis on the status of the willingness to pay for agricultural insurance for tea trees of tea growers showed that the households would like to pay different amounts depending on many factors such as level of education of the household head, household head sex, economic conditions, tea growing area or risks encountered in the production process. In order to quantify these effects, the research used linear regression models as is described in the research methods.

The results of the regression model describe factors that influence, in a statistically meaningful way, the willingness to pay for agricultural insurance for tea trees include: household head sex, education level, economics conditions, tea growing area and location. The levels of influence are as follows:

*In terms of gender:* the average willingness to pay to join the of agricultural insurance market for tea tree of men is VND 15,430 higher than that of women, which is explained that household head men are often more decisive in spending and have better awareness on production risk prevention.

*In terms of education:* education levels are included in the model as a continuous variable. The model shows that with every each year increase, the willingness to pay of tea growers tend to be VND 12,000 higher. In fact, people with high education levels are often aware of the production risks better than those with lower education levels.

*In terms of economic conditions:* economic conditions of the tea growers are recognized on 3 types of households: rich, medium and poor households; in which the poor are considered subject for comparison. Results of the regression model analysis indicates that those with better economic conditions are likely to pay higher agricultural insurance, around VND 652,000/ha/year higher than the poor households; also following this trend, the medium households are willing to pay VND 230,000 VND/ha/year higher compared to poor households. It can be said that the income of the family decides the ability to pay agricultural insurance fee of tea growers; those with better economic conditions have needs for agricultural insurance and will provide a higher willingness to pay.

*In terms of growing area:* In our research, the households' tea growing area is divided into 3 groups: small (0.31ha); average (0.74ha) and large (1.63ha). The



regression model results show that when the tea growing area of the households increases by 1 ha, the level of willingness to pay for agricultural insurance in tea production will grow by VND 1,182,24 thousand/ha/year.

*In terms of growing locations:* as mentioned above, the research selected four districts with large area of tea growing in Phu Tho province which are Doan Hung, Thanh Ba, Thanh Son and Yen Lap. Yen Lap is mountainous and the most remote district, so it was chosen for comparison. It can be seen that the willingness to pay of tea growers in the various districts also differ considerably; tea growers in Doan Hung district pay the highest rates, VND 40,000/ha higher than those in Yen Lap district and people in Thanh Son pay the least, VND 12,600 dong/ha less than those in Yen Lap.

### CONCLUSION

Through studying and direct interviewing 1,000 tea growing households, the research identifies that there are 46.7% of the households are in need to participate and 53.3% of the households have no wish to join the agricultural insurance market. The level of the average willingness to pay is estimated to be 2,407.07 (thousand VND/ha/year). If agricultural insurance is successfully implemented in the province, it is estimated that the total agricultural insurance fund would be VND 34-35 billion/year.

Besides, the research has synthesized a number of people's recommendations for the agricultural insurance market participation: (i) 91.86% of the participating households requires agricultural experts and local authorities to be present at the time of loss evaluation; (ii) about 70% of the households want to buy agricultural insurance and receive compensation for loss at the office of commune authorities; (iii) the majority of the participating households (80.94%) want to receive compensation in cash for loss; (iv) tea growers expect the Government to support up to 93% of insurance fee for poor households.

The research has also analyzed a number of factors affecting the needs for agricultural insurance participation of tea growers in Phu Tho province. The factors being analyzed are gender, education level, tea farming area, economic conditions of tea growers and geographical factors. The survey shows that the average willingness to pay to join the market of agricultural insurance for tea of men is higher than that of women; the willingness to pay of tea growers with high educational levels tend to rise; the willingness to pay depends on the area of tea growing of households, households with greater area have higher level of willingness to pay; the willingness to pay for participating in agricultural insurance for tea trees of tea growers in Doan Hung district is the highest.

To attract tea growers to participate in agricultural insurance for fresh tea leaves production:

(1) It is a need to develop an insurance product for the production of fresh tea leaves which is suitable and accessible for farmers, thus creating basis for the confidence of producers in the existing products. (2) Actively disseminating general agricultural insurance policy to local authorities, farmers' union,

agricultural extension stations and especially farmers. (3) Agricultural insurance policy must be specific and in accordance with the production conditions, habits and mentalities of tea growers. (4) Opening training courses for farmers; compensate expenses for enterprises to implement agricultural insurance; supporting tea growers to participate in agricultural insurance. (5) Functional agencies need to cooperate closely with local authorities, businesses to regularly review the mechanisms and policies, , to attract the participation of households on the basis of ensuring the harmony among the interests of people, insurance agencies and the government. (6) Strengthening the coordination between the Government, insurance, reinsurance agencies, credit and financial institutions and the people.

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