

Estimating the Willingness of Urban Residents in Khammouane Province to pay for the Hinnamno National Protected Area: The CVM Approach

Thongsa Tounmansone, Phouphet Kyophilavong*, Phetsamone Pommavong, Bounmy Inthakesone and Maikham Khamsoukthavong

Faculty of Economics and Business Management, National University of Laos Saythani, Vientiane, Capital Lao People's Democratic Republic

*Corresponding author: Phouphet Kyophilavong, National University of Laos Saythani, Vientiane, Capital Lao People's Democratic Republic, Tel: +8562055527321; E-mail: phouphetkyophilavong@gmail.com

Received date: July 06, 2018; Accepted date: August 27, 2018; Published date: August 31, 2018

Copyright: © 2018 Tounmansone T, et al. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

The objective of this study is to estimate the Willingness to Pay (WTP) of urban residents in Khammouane Province for the Hinnamno National Protected Area and seeks to identify the factors affecting WTP. Willingness to pay was estimated using a Contingent Valuation Method (CVM) approach through an open-ended questionnaire conducted in person. The analysis relies on a censored tobit regression. Data used for analysis came from sampling urban residents in Khammouane Province with a 390 person sample size in 2017. The estimate of the empirical model that is used for the econometric analysis is based on the model constructed by Tobin. This study finds a mean WTP of 6,456.41 kip (USD 0.81) per household per month. We multiplied this value to the total number of households in Thakhek, Khammouane Province for a total value of 1,331,828,255 kip/year. The significant factors influencing willingness to pay were marital status, period of living (length stay at village), access to Hinnamno National Protected Area and monthly income, all of which have a statistically positive impact on WTP. Conversely, the number of family members has a statistically significant negative impact on WTP. The authors conclude that WTP of urban residents to protect the Hinnamno National Protected Area is relatively high. These results offer information to policy makers dealing with the logging, hunting and harvesting problem in Hinnamno National Protected Area in Khammouane Province. This is the first paper trying to investigate the WTP of Urban Residents for the Hinnamno National Protected Area in Lao PDR.

Keywords: Hinnamno National Protected Area; Contingent Valuation Method (CVM); Laos

Introduction

Lao PDR is a country rich with natural resources, especially forest resources. In 1940, the forest covered up to 17 million hectares, or around 70% of the country's total area [1]. In 1993, the Government of Laos established the first National Biodiversity Conservation Area (NBCA) by Decree No. 164 / PM (now called National Protected Areas), comprising 18 national protected areas, accounting for about 12% of the country's total area [2]. Currently, there are 24 national protected areas covering 3.8 million hectares or 18% of the total land area [3]. Khammouane province has a total area of 577,000 ha of forest, including 3 national protected areas, Nakai-namteun, Phouhinpoon and Hinnamno. According to an IUCN survey in 1997, Hinnamno National Protected Areas is around 31% forests. 20% is dense forest, and surveys conducted in 2009, found many species of fauna. In addition, there are also many NTFPs [4].

The protected area system of the Lao PDR is one of the ecologically representative protected area systems in the world. Currently, Laos is a country with a diverse range of biodiversity, such as forests, wildlife and non-timber forest products [5]. These are very important and provide great benefit both directly and indirectly to socio-economic development, the environment, the livelihoods of the people and scientific research. In particular, Hinnamno national protected area is natural resources and an abundance of biodiversity. It plays an important role in the economy and livelihoods of the people due to the

benefits of logging: wood, electricity, water, non-timber forest products and tourism, mostly natural tourism as a major attraction.

However, in the past several years, the Lao PDR has faced a dramatic reduction in forest and degraded forest resources – demonstrated by the fact that the forests declined dramatically from 70% in 1940 to 47% in 1992 [1]. In 2002, forest cover remained around 41.5% [1]. In interviews with people whose work is related with hinnamno national protected area, we found traces of illegal logging, hunting and harvesting in protected areas occurred about 55 times per year, which is the main reason that makes the biodiversity in those areas decline. Therefore, the government had a policy to conserve biodiversity in Laos, but it needs an enormous budget, while the government has many priorities. So, the participation of the people is important to the operation of conservation.

Therefore, if the problem is not solution, the biodiversity will be reduced in that area in the future, Finally, the nation and the local population will not only lose the opportunity to generate income, but also impact the biodiversity of Laos. Biodiversity loss may also impact the livelihoods of people, such as dry water sources, dry weather, natural disasters, unprotected use of forests, wildlife, NTFPs, and other problems. There are many causes of biodiversity lose, such as a lack of good management, and budget.

Until now, no study has been undertaken on the participation of urban residents in Laos in the conservation of hinnamno national protected area. This study aimed to estimate the willingness to pay of Urban Residents in Khammouane Province for the Hinnamno National Protected Area Conservation using the CVM approach.

Description of the Area

Hinnamno National Protected Area (NPA) is situated in Bualapha District, Khammouane Province in Central of Lao PDR. It encompasses an area of 82,000 ha (at latitudes 17°14'-17°40' and longitudes 105°42'-106°11'). It is a portion of a discrete limestone massif situated in the Annamite mountain range. It is one of the Original 18 National Biodiversity Conservation Areas (now called NPAs) of Lao PDR established on the 29th October 1993 by Prime Ministerial Decree 164 [5]. It is one of the largest karst landscapes in Southeast Asia, being contiguous with Phong Nha-Ke Bang National Park in Central Vietnam, a limestone ecosystem which is already listed as natural World Heritage Site, and it is loosely connected to Phou Hin Poun NPA, itself a karst dominated NPA in Khammouane province. It is also contiguous with the Nakai Nam Theun NPA, which is located directly north of Hinnamno NPA. Surveys of surface habitats in Hinnamno have recorded 377 vertebrate species, including 55 mammals, 184 birds, 21 reptiles, 21 amphibians and 96 fish. Of these, 37 species are of conservation interest, and 11 of these are globally threatened. Most notably, Hinnamno protects seven species of primates, five of which are globally threatened [5].

Literature Review

There are few studies on the Willingness to Pay for protection of environment and biodiversity in Laos. Kyophilavong and Bennett [6] sought to estimate the willingness to pay for cleaning up road dust in Vientiane, Laos. Using CVM allowed their study to confirm that the residents have an average willingness to pay 7,069 Kip (USD 0.86) per person per month to control road dust, and the study found that education and income have a statistically positive impact on WTP. Conversely, the number of children in a family has a statistically negative impact on WTP. Luangmany and Vorlavong [7] assessed people's willingness to pay using the CVM. The study investigated the WTP of residents for the sustainable development and maintenance of an urban park in the city and showed that the average willingness to pay was 10,741 Kip/month/household. The WTP was positively influenced by income and negatively influenced by bid prices. Thanatthep et al. assessed the WTP for biodiversity conservation and sustainability in the houay nhang protected area [8]. Using the CVM, responses showed that the monthly WTP contribution that would be acceptable to the people was 5,000 kip. The WTP was positively influenced by gender and education levels, and conversely, bid prices had a negative influence. Pangxang estimated the willingness to pay of urban residents in Vientiane Capital for conservation of the Green Peafowl in PhouKhaoKhouay national protected area by applying choice modelling [9]. The factors that positively influenced the utility for choosing the management action option are access, costs, income, age and gender. Factors that do not influence the utility for choosing are the number of green peafowl (birds), the number of households that are located close to the green peafowl conservation zone (house) and education level. Souvannasy estimated the factors Affecting the Willingness to pay for Wildlife Conservation (e.g. of the Sambar, Muntjac, Serow and Wild Pig) in Phouchomvoy Conservation Area, Khamkerd District, Borlikhamxay Province [10]. Using the CVM and showed the average WTP was 1,828 kip/month. The WTP was positively influenced by income and negatively influenced by age.

In another country, Boonyarakthaya [11] estimated the economic value of Termites Mushroom conservation and analyzed the factors that influenced decision-making in supporting conservation forest areas in Kanchanaburi Municipality, Thailand. The study found that

the majority of respondents expressed a mean willingness to pay of 424baht/household. The factors which influenced WTP were income and bid price. In a study of Malaysia, Kamri [12] also found that an average WTP was RM 16.14 for international visitors per visit and RM 7.38 per local visitor per visit for improvements in environmental conservation. The WTP was strongly positively influenced by gender, education and income. Angella et al. estimated the willingness to pay for irrigation water and its determinants among rice farmers in the Doho rice irrigation Scheme (DRIS) in Uganda [13]. The study findings show that while farmers have a WTP of 20,000 (USD 8) /acre/season on average and their WTP was strongly positively influenced by education, total land owned, practical experience, training in soil/water conservation/rice growing, and access to credit, and negatively influenced by distance from the household to the nearest market. Khuc estimating urban households' willingness to pay for upland forest restoration in Vietnam [14], the mean value of WTP was 37,830 VND (USD 1.73)/household/month and the study findings were positive influenced by education, income. Le Hoa and Thi estimating the willingness to pay for the preservation of Lo Go - Xa Mat national park in Vietnam [15], and their study found that households had a WTP of at least 6,209 VND /month for the year and the factors positively affecting households' WTP were education level. Bandara and Tisdell [16] estimated the willingness to pay for conservation of the Asian Elephant in Sri Lanka, at a mean of Rs 110.07 / month and was positively influenced by respondents' awareness of the current issues in the conservation of elephants and mitigation, pro-conservation opinions and perceptions, personal income, whether the respondent was the head of the household, and years of schooling, and were negatively influence by age and bid price. In sum, there are very few studies on the WTP on national area protection in Laos.

Methods

The questionnaire designed for this study was based on some key sources [6,11,15], interviews with government agencies, and focus group discussions. Before the formal survey, one pre-test was conducted with 15 respondents. Based on the feedback from the pre-tests, the questionnaire was revised. Interviews were limited to 20-30 minutes. The questionnaire consisted of five parts: (1) Overview of problems that arise with the Hinnamno NPA, (2) WTP for the Hinnamno National Protected Area; (3) About Hinnamno National Protected Area, (4) Personal Data (5) socioeconomic characteristics.

In the willingness to pay (WTP) part of the survey, respondents were asked their maximum WTP for the conservation Hinnamno National Protected Area, It makes preventing illegal logging, hunting and harvesting of Non-timber forest products over a 10 year period. An increase in respondents' Electricity bill was specified as the payment vehicle. Before asking the open-ended WTP question, the negative impacts of illegal logging, wildlife poaching and non-timber forest product collection were explained. Second, details of a proposed project to Preserve of Hinnamno National Protected Area were set out. Third, the impacts of the project on logging (deforestation), hunting of wildlife and harvesting of timber forest products were described. Fourth, the details of the payment vehicle were provided. In addition, pictures of current biodiversity lose and deforestation were attached to the questionnaire and shown to respondents during the interview.

The survey was conducted from 26 march 2017 to 03 April 2017 in Thakhek districts of Khammouane Province. A total of 390 responses were collected. The survey was carried out by students and lecturers from the Faculty of Business Management at Savannakhet University.

Face to face interviews with the household head were used. The student and lecturer interviewers were trained before conducting the survey [17].

In this study, assuming that the dependent variable (Willingness to pay) is uncensored, a Tobit is applied for estimating the following equation, which was constructed by Tobin J [18].

$$WTP = \beta_0 + \beta_i X_i + \varepsilon_t$$

Where *WTP* is an outcome (Willingness to pay) of the respondent; X_i is a vector of the characteristics such as the gender of respondent,

age of respondent, education level of respondent, marital status of respondent, access to NPA of respondent, membership in an environment conservation of respondent, duration of residence respondent, household size, and household income; β_0 is constant; β_i are unknown parameters; and ε_t is an error that represents unmeasured characteristics that determine the outcomes. The details of the variables for the regression are in Table 1.

Variables Definition		Unit	Expected Sign	Sources of Variable
Independent Variable				
wtp	Willingness to Pay to Respondent	Kip		
Dependent Variable				
Gender	Gender of Respondent	Male=1 and Otherwise=0	Positive	7
Age	Age of Respondent	Year	Negative	8
Occupation	Occupation of Respondent	Government=1 and Otherwise=0	Positive	6
Education	Education of Respondent	Year	Positive	12
Status	Status of Respondent	Single=1 and Otherwise=0	Positive	6
Ethnic	Ethnic of Respondent	Lao_ethnic=1 and Otherwise=0	Positive	Author
HS	The number of Family members	Person	Negative	11
PL	Period of Living of Respondent	Year	Positive	Author
ATH	Access to Hinnamno of Respondent	Access=1 and Otherwise=0	Positive	9
MCEO	Member of Conservation Organisation	Member=1 and Otherwise=0	Positive	11
LnY	Log of Monthly Household Income		Positive	6
Sources: Compiled by authors				

Table 1: Definition of Regression Variables.

Socio-Economic Characteristics of Respondents

The socio-economic characteristics of the respondents were investigated and are shown in Table 2. About 40 percent of the respondents were male. The average age was around 39 years old. About 30 percent were single. On average, respondents had 10 years of education. The average household size was 5 people, including children. On average, respondents had lived in the area for 25 years, about 19 percent had access to the NPA, about 5 percent were members of Environment Conservation Organization, About 31 percent were government officers and about 97 percent were Lao (Table 2).

Willingness to Pay

The mean WTP of urban households in Khammouane Province for the conservation of Hinnamno National protected area was calculated by the positive and Zero WTP with the whole sample (with protest vote), we found that the mean WTP was 6,456.41 kip and most respondents were willing to pay 5,000 Kip/month /household (30.77%), the next largest category of respondents was 10,000 kip/

month /household (18.21%) and next was 3,000 kip/month/household (10.51) and so on.

Beside that, some respondents (14.10%) were not willing to pay (0 kip) (Table 3).

There are many reasons given for being willing to pay towards the conservation fund of Hinnamno National Protected area.

Among the respondents who answered “Yes” to the WTP question, most of them wanted to conserve the Hinnamno National Protected area for the future (63.17%) while many wanted to conserve it for using in the future (10.48%) and out of moral duty (10.48%).

Others thought that they wanted to conserve it because plants and wildlife have the right to exist (9.58%), wanted to protect the environment of Lao in general (6.29%) and finally some thought they would visit the protected area (0.3%).

The results below show that the mean WTP is higher in the case without protest votes. Each household, on average, can be said to have a willingness to pay 7,516.42 kip per month for ten years for the conservation plan (Table 4).

Socio-economic condition	
Male (%)	40.26
Age (Year)	39.28
Education (Year)	10.78
Single (%)	21.79
Household size (person)	5.19
Duration of residence in area (Year)	25.42
Access (%)	19.23
Member of Environmental Conservation Organization (%)	5.64
Income (Kip/month/household)	43,240,56
Main Occupation (%)	
Government	31.03
Private	2.82
Commerce	34.1
Retired	4.87
Farmer	2.82
Labourer	6.92
Student	8.97
Housewife	7.69
Other	0.78
Ethnicity (%)	
Lao	97.44
Phouthai	1.54
Other	1.03
Sources: Authors' survey, 2017, and the authors' calculations	

Table 2: Socio-Economic Characteristics of Respondents.

Willingness to pay (Kip)	Number of interviewees	Percentage (%)
0	55	14.1
1,000	30	7.69
2,000	41	10.51
3,000	28	7.18
4,000	3	0.77
5,000	120	30.77
10,000	71	18.21
15,000	6	1.54
20,000	26	6.67
25,000	2	0.51

30,000	3	0.77
50,000	5	1.28
Total	390	100
Sources: Authors' survey, 2017, and authors' calculations		

Table 3: Range of WTP of Respondents.

Reasons for payment	Number of interviewees	Percentage (%)
I want to conserve the Hinnamno protected area for future generations	211	63.17
I am willing to contribute to using Hinnamno protected area in the future	35	10.48
I am contributing because plants and wildlife have the right to exist.	32	9.58
It is my moral duty to contribute to the Hinnamno protected area	34	10.18
I want to conserve the Hinnamno protected area because this also contributes to protecting the environment of Laos in general	21	6.29
I want to conserve the Hinnamno protected area because I will visit it	1	0.3
Total	334	100
Sources: Authors' survey, 2017, and the author s' calculations		

Table 4: Reasons for Positive WTP.

Table 5 shows the reasons for respondents not being willing to pay for the conservation of the Hinnamno protected area. Among the respondents answering "No" to the WTP question, most of them (35.71%) thought that it should be the government's responsibility or that the government should pay and that they do not believe that paying would solve the problem.

Many do not have money, as other expenditures are high (19.64%), others said they thought a person who gets direct use should pay (7.14%) and others that other places were more important (1.79%) (Tables 5 and 6).

Reasons not to pay	Number of interviewees	Percentage (%)
I don't believe that paying will solve the problem	20	35.71
A person who gets direct use should pay	4	7.14
Do not have money, other expenditures too high	11	19.64
Government should pay	20	35.71
Other places are more important	1	1.79
Total	56	100

Table 5: Reasons for Zero WTP.

Variable	Definition	Mean	Standard Deviation	Minimum	Maximum
wtp	Willingness to Pay to Respondent	6,456.41	7,611.51	0	50,000.00
Gender	Gender of Respondent	0.4	0.49	0	1
Age	Age of Respondent	39.28	12.75	18	73
Occupation	Occupation of Respondent	0.31	0.46	0	1
Education	Education of Respondent	10.78	4.76	0	18
Status	Marital Status of Respondent	0.22	0.41	0	1
Ethnic	Ethnic of Respondent	0.97	0.16	0	1
HS	The number of Family members	5.19	1.86	2	13
PL	Period of Living of Respondent	25.42	14.07	1	66
ATH	Access to Hinnamno of Respondent	0.19	0.39	0	1
MCEO	Member of Conservation Organisation	0.06	0.23	0	1
Y	Monthly Household Income	43,24,056.00	33,14,229.00	5,00,000.00	3,00,00,000.00

Sources: Authors' survey, 2017, and the authors' calculations

Table 6: Mean, Standard Deviation, Minimum and Maximum.

Factors Affecting Willingness to Pay

Multiple regressions were applied to estimate the willingness to pay of urban residents for the national protected area conservation. The regression model might have econometric problems such as multicollinearity, heteroskedasticity, and autocorrelation that can be investigated and removed during the estimation. Multicollinearity is a very severe problem when using a censored to bit regression method. If the coefficients of the correlations between the explanatory variables

have an absolute value equal to or above 0.60, then the multicollinearity is severe [17]. The explanatory variables for this study were verified to have no multicollinearity because their absolute value is 0.56. In addition, the White test is applied to detect heteroskedasticity and is not found in the WTP regressions. We removed this problem by applying heteroskedasticity-robust standard errors.

Variable	Definition	TOBIT			
		Coefficient	Prob	Marginal Effect	Prob
Gender	Gender of Respondent	531.26ns	0.63	531.26ns	0.53
Age	Age of Respondent	-0.18ns	-0.38	-0.18	0.71
Occupation	Occupation of Respondent	114.01ns	0.11	114.01ns	0.91
Education	Education of Respondent	29.27ns	0.27	29.27ns	0.79
Status	Marital Status of Respondent	2558.80**	2.34	2558.80**	0.02
Ethnic	Ethnic of Respondent	1536.45ns	0.62	1536.45ns	0.54
HS	The number of Family members	-452.90**	-2.1	-452.90**	0.04
PL	Period of Living of Respondent	106.13***	3.45	106.13**	0.00
ATH	Access to Hinnamno of Respondent	5950.70***	5.84	5950.70**	0.00
MCEO	Member of Conservation Organisation	189.29ns	0.11	189.29ns	0.91
LnY	Log of Monthly Household Income	3999.36***	5.88	3999.36***	0.00

_Cons		-58309.09***	-5.82		
No. of obs		390			
LR chi2 (11)		119.80			
Prob>chi2		0.00			
Pseudo R2		0.017			
<p>Note: 1) The superscripts ***, **, and * denote rejection at 1%, 5%, and 10% critical values and ns denotes not significant. 2) Heteroskedasticity has been tested and corrected. Source: Authors' survey data, 2017, and the authors' estimations</p>					

Table 7: Factors Affecting WTP.

The results are shown in Table 7. As expected, Income strongly influences WTP. The respondents who have higher a income have a coefficient with the expected positive sign. The sign shows that there is a positive relationship between the respondents' income and their WTP and that thi positive relationship is significant at the 1% level. This significance implies that respondents have WTP because the respondents who have a higher income wanted to donation. This result is consistent with the results of some other studies [6,7,10-12,14,16].

Also the Access to the location of respondents strongly influenced WTP. There is a coefficient with the expected positive sign. The sign shows that there is a positive relationship between access to the location of respondents and their WTP and is significant at the 1% level. This makes sense because whoever has been to the location, would better know the situation, so they have a higher WTP. This result is consistent with the results in a study by Pangxang [9].

The amount of time respondents had lived in urban area in Khammouane Province strongly influenced WTP. This variable had a coefficient with the expected positive sign. The sign shows that there is a positive relationship between the amount of time respondents had lived in urban Khammouane Province and their WTP, and is significant at the 1% level.

The number of family members (or household size) has a significant negative influence on the WTP and is significant at the 5% level. This effect might result from the fact that household which have many members have higher overall expenses to support all members of the household. This result is in contrast to the study by Kyophilavong and Bennett [6] that shows that household size has a negative and significant effect on WTP, but contrasts with some studies [11,13] finds that the number of family members of the respondents' household has no significant impact on WTP.

The respondent who was married has a positive influence and significant effect on the WTP and is significant at the 10% level. This result is consistent with the result in some studies [6,12]. But these results contrast other studies [11,15] that find that respondents who got marry has no significant impact on WTP.

The variables for the socio-economic characteristics of the respondents including Gender, Occupation, Education, Ethnicity and Membership in an environmental society have positive effects on WTP

but are statistically insignificant. Age of respondents has a negative impact but is insignificant.

Conclusion and Recommendation

The main objective of this paper was to estimate urban residents' Willingness to Pay (WTP) for the conservation of Hinnamno national protected area in Khammouane province, Laos. The Contingent Valuation Method (CVM) was used and seek factors affecting WTP were identified using a Censored tobit regression analysis.

The WTP for the conservation of hinnamno national protected area in Khammouane province was 6,456.41 kip (USD 0.81) per person per month. We multiplied this value by the total number of households in Thakhek, Khammouane Province. It would give a total value of 1,331,828,255 kip/year. The main reason for respondents' WTP was for protecting this national protected area, and reducing illegal logging, hunting and harvesting. Respondents who have higher incomes, are single, longer period of living (the length of stay at Village), and also who has been to hinnamno, have a higher WTP.

The results indicate that Khammouane province residents will benefit from conserving hinnamno national protected area. This is useful information for government agencies to consider. It will help them understand the benefits of conserving the national protected area by taking action to enhance law enforcement for preventing illegal logging, hunting and harvesting.

In addition, there are very few studies of the valuation of public goods in Laos. This study is an important contribution toward the wider use of CVM to evaluate non-market goods for Laos. However, this analysis and the use of non-market valuation in general faces several challenges for application in the Laotian context. First, biases relating to the use of monetary measures in an emerging market economy with a strong history of central planning may be difficult to resolve. Second, stratified random sampling techniques are difficult to implement in Khammouane province where information about the population is available only at the broadest level of detail. Third, the use of alternatives to the open-ended CVM should be explored in further research. Dichotomous choice CVM or Choice Modeling might be appropriate for future studies.

References

1. World Bank (2005) Lao PDR Environment Monitor, World Bank Country Office and Science Technology and Environment Agency, Vientiane, Lao PDR.
2. Department of Forestry (2005) Forestry Strategy 2020 of Lao PDR, No. 229/PM, Vientiane.
3. MONRE (2016) National Biodiversity Strategy and Action Plan 2016-2025, Department of Forest Resource Management, Ministry of Natural Resources and Environment, Vientiane.
4. Department of forestry Resource Management (2012) Report on Hinnamno National Protected Area, Ministry of Natural Resources and Environment.
5. MONRE (2015) Hinnamno Protected Area Co-Mangement Plan 2016-2020, Department of Forest Resource Management, Ministry of Natural Resources and Environment, Vientiane.
6. Kyophilavong P, Bennett J (2011) Willingness to pay for Cleaning up Road Dust in Vientiane. *International Business and Management* 3: 12-18.
7. Luangmany D, Voravong S (2009) Estimate the People's Willingness to pay for the improvement of Say saysetha Park, Vientiane Capital City, Economy and Environment Program for Southeast Asia.
8. Thanthathep KK, Souphonphacdy D, Baylatry M (2009) Estimate the Economic Value of the Houy Nhang Protected Area, Vientiane Capital City, Economy and Environment Program for Southeast Asia.
9. Pangxang Y (2016) Estimating the Willingness to pay of the Suburban of Residents in Vientiane Capital for the Conservation of Green Peafowl in Phoukhaokhouay National Protected Area by Applying Choice Modelling, Faculty of Economic and Business Management. National University of Laos.
10. Souvannasy N (2016) Factors Affecting of Willingness to pay for Wildlife Conservation (Sambar, Muntjac, Serow and Wild Pig) in Phouchomvoy Conservation Area, Khamkerd District, Borlikhamxay Province, Faculty of Economic and Business Management. National University of Laos.
11. Boonyarakthanya W (2009) Willingness to pay for Termites Muhroom Conservation: A Case Study in Kanchanaburi Municipality, School of Economics, Sukhothai Thammathirat Open University, Thailand.
12. Kamri T (2013) Willingness to pay for Conservation of Natural Resources in the Gunung Gading National Park, Srawak. *Procedia-Social and Behavioral Sciences* 101: 506-515.
13. Angella N, Dick S, Fred B (2014) Willingness to pay for irrigation Water and its determinants among rice farmers at Doho Rice Irrigation Scheme (DRIS) in Uganda. *Journal of Development and Agricultural Economics* 6: 345-355.
14. Khuc VQ, Alhassan M, Loomis BJ, Tran DT, Paschke WM (2016) Estimating Urban Households' Willingness-to-Pay for Upland Forest Restoration in Vietnam. *Open Journal of Forestry* 6: 191-198.
15. D LH, Ly TYN (2009) Willingness to pay for the Preservation of Lo Go – Xa Mat National Park in Vietnam, Economy and Environment Program for Southeast Asia.
16. Bandara R, Tisdell C (2002) Willingness to pay for Conservation of Asian Elephants in Sri Lanka: A Contingent Valuation Study. Working Paper No. 67.
17. Kyophilavong P, Tsechalicha X (2011) Sustainable Financing Mechanism for National Protected Area Management in Lao PDR: Issues and Option, Department of Forestry, Ministry of Agriculture and Forestry in collaboration with IUCN Lao PDR.
18. Tobin J (1958) Estimation of Relationships for Limited Dependent Variables. *Econometrica* 26: 24-36.