

ESTIMATION OF THE WILLINGNESS TO PAY FOR PRESERVATION OF LE QUY DON PARK IN THAI BINH CITY, THAI BINH PROVINCE, VIETNAM

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Abstract

The main objective of the study is to estimate the willingness to pay (WTP) for conserving the Le Quy Don park in Thai Binh city, Thai Binh Province, Vietnam. In doing so, contingent valuation method is applied. A survey of 128 households by face-to-face interview using questionnaire was conducted in Thai Binh city. The results of the study showed that each household of the Thai Binh City were willing to pay 27.1 thousand VND/quarter or VND 108,532.3 every year for preserving the public parks in the city. The WTP for preservation of Le Quy Don park is affected by household leaders' education level, income and distance from the park. The higher education level and higher income will bring higher WTP while the farther from the park, the lower WTP.

Keywords: *contingent valuation, willingness to pay, public parks.*

1. Introduction

Urban parks are considered as important contributors to a sustainable development of cities both in developed and developing countries. They bring the local people a wide range of benefits such as recreational activities, fresh air, aesthetic, and ecological functions. Urban parks can sequester carbon dioxide emissions and produce oxygen (Jo, 2002). They are also a major contributor in stabilizing the urban climate, the growth of biodiversity (Konijnendijk et al., 2005) and economic development. Besides many environmental and ecological services, urban nature provides important social and psychological benefits to human societies, which enrich human life with meanings and emotions (Chiesura, 2004). This maybe the reason for an increasing interest for their development in urban setting. Hence, a policy that aims at improving on urban environmental amenities by the provision of public goods such as urban parks make life in cities easier (Warner and Hefetz, 2002). The creation of urban parks has become a major concern for policymakers who are greatly interested in the importance and value of urban parks (Jacobs, 1961). Therefore, the improvement of urban parks is aimed at harmonising town planning with the environment in the quest for sustainable cities. Due to a large increase in urban

population, these open spaces are increasingly in demand for the numerous advantages they offer. Residents of urban areas generally place a lot of importance on urban parks and green spaces and some of them are more willing to directly or indirectly fund their creation to obtain the benefits or amenities they provide (Bolund and Hunhammar, 1999). The amount that the visitors are willing to pay for an improved urban park is relevant to stakeholders when making tariff decisions.

In Vietnam, the urban park which were defined public space in the Circular 19/2010/TT – BXD of Ministry of Construction is one of the criteria to rank the cities in Vietnam. However, urbanization, economic growth and rapid population growth is posing growing challenges to public space. In this study, we took the Le Quy Don Park in in Thai Binh city, Thai Binh province to investigate the state and condition of public parks and estimating the willingness to pay (WTP) for preserving it. In Thai Binh city, to meet the requirements of rapid urbanization and standards of grade I urban areas, the investment in upgrading and modernizing the urban technical infrastructure system, water supply and drainage, roads, public Members ... and development of public space is a policy set out by the City Party Congress for the term 2020 - 2025. At present, with the rapid urbanization rate and the rapid population growth, the green spaces of the park are no longer balanced with the urban areas. Besides, due to less investment, these parks do not meet the entertainment and entertainment needs of the people. Green parks are now “a luxury” for the city. Le Quy Don Park in De Tham ward, Thai Binh city, has a total land fund of nearly 34,000 m², of which land for flower gardens and trees is more than 23,000 m², including 360 trees. Although it is the park with the largest scale and located in the city center, Le Quy Don Park still has many shortcomings: the land area is used for wrong purposes; poor and degraded facilities; the loose management of functional agencies; status of hygiene, security, order and safety; does not attract people, especially young people; The percentage of trees in the park is not really “green” enough. From the above shortcomings, the research and assessment of the willingness to pay (WTP) for the maintenance and improvement of the park is extremely important and necessary to ensure the sustainable development and direction.

The main objective of this study is to value the Le Quy Don park in Thai Binh City, Thai Binh province by estimating the willingness to pay (WTP) for preserving it, which will provide us a monetary estimate about its importance. And the more specific objectives of the study are as follows: (i) To identify the explanatory factors influencing the willingness to pay; (ii) to trace out the main problem (s) prevalent in public parks, and (iii) to suggest ways to concerned bodies for improvement and development of public parks.

2. Methods

In valuing environmental goods like public parks, the value includes both use (value derived from actual use of a good or service) and non-use (also referred to as passive use values, are those not associated with actual use, or even the option to use a good or service) values. Accordingly, contingent valuation method (CVM) would be relatively more

appropriate for our study, which is used to estimate both use and non-use values and can be applied to find economic values for almost all kinds of environmental amenities.

2.1. Questionnaire design

First of all, in order to ensure the quality of a large-scale investigation, the study developed a sample questionnaire and conducted a pilot survey with 10 people. The questionnaire was revised based on the observed shortcomings during the pilot investigation, so that it was included in a large-scale investigation. The research was conducted based on the survey of the people through the random assessment method (CVM) questionnaire. The structured questionnaire consisted of 4 parts: Part 1 contains questions on the perception of the benefits that the park brings to people in terms of health, spirit, environmental improvement, urban landscape construction. Part 2 has 6 questions to gather qualitative information on people's perceptions and perceptions about the renovation and maintenance of Le Quy Don Park, the important benefits the park brings, and the inadequacies of the park are given priority. overcoming and developing the development orientation of the park. Respondents were asked to select the level of importance that they consider most appropriate for each question about problems of and their level of interest in the park. The third part collects information on people's willingness to pay (WTP) level for the renovation and maintenance of Le Quy Don Park in Thai Binh City. Before answering the question about the level of WTP, the respondents were specifically explained about the current status of Le Quy Don Park, and the reasons for the park preservation. Following is the description of the hypothetical scenario as follows: "Every year, every household must pay money into the Infrastructure Development Fund for the protection and development of Le Quy Don Park and collect via quarterly garbage collection service bill. This amount of money will be used for renovation and maintenance of Le Quy Don Park in Thai Binh City". a Binary question is used to ask the Willingness-to-pay with 3 levels of payment: 15 thousand VND, 30 thousand VND and 45 thousand VND per person per quarter. Respondents should answer whether they are willing to pay the rates asked for the renovation and maintenance of Le Quy Don Park. Payment rates are randomly distributed to each person. Following this scenario are some questions about the certainty of respondents' responses and why they are not willing to pay (if $WTP = 0$). The fourth part includes questions about the socio-economic characteristics of the respondents. Questions include age, gender, education level, occupation, income, years lived in the city, plan to live permanently in Thai Binh City, and distance from home location to the job member Le Quy Don.

2.2. Data collection

Data and information on people's perceptions and perceptions, willingness to pay for park rehabilitation and maintenance and information on their socio-economic characteristics were collected through face-to-face interview. The study surveyed and interviewed 128 people (representing 128 households). The study uses a stratified sampling method for a sample of 128 people of Thai Binh city, in which the number of samples in each ward is determined based on the ratio of the population of each ward to the total population of wards.

Specifically, the study was investigated in 4 wards: De Tham (21 households); Ky Ba (29 households); Bo Xuyen (27 households); Tran Hung Dao (15 households) and 2 communes: Dong Xuan (15 households); and Vu Chinh (21 households).

3. Results

3.1. Descriptive statistics of the sample

The average age of respondents is 38 years old, mostly between 25 and 55 years old. Regarding the sex ratio of the subjects surveyed is similar in 128 samples, there are 59 males (46%) and 69 females (54%). The survey results show that the majority of interviewees have a relatively high education level (Table 2.1). Respondents have university and college degrees (54 respondents), accounting for 42.19%, followed by postgraduate qualifications (9 respondents), accounting for 7.03%. The number of respondents with high school degree is 43 samples, accounting for 33.59%. 22 respondents left finished secondary or primary school, accounting for 17.19%.

Of the 128 respondents surveyed, 21.09% are civil servants / state officials / private enterprises and 31.25% are workers / employees / managers of private enterprises, 25% are self-employed. The houseworkers and retired people account for 17.19% and students account for 5.47%. The income level of the interviewees in the survey sample fluctuates between the lowest of less than 1 million VND and the highest of 15-20 million VND with the average income of about 6 million VND. This is a factor that will greatly affect people's willingness to pay for the renovation and maintenance of Le Quy Don Park. Most of the respondents will definitely intend to live permanently in Thai Binh City, accounting for 86%, 12% are unlikely to live permanently in Thai Binh City. There is only a small percentage of the respondents do not live permanently in Thai Binh City.

Table 1: Education level of the sample

Education level	Number of survey samples	Percentage
Secondary or primary school	22	17,19%
High school level	43	33,59%
University and college degrees	54	42,19%
Postgraduate	9	7,03%

3.2. People's assessment of Le Quy Don Park

Park benefits

Regarding the benefits that Le Quy Don Park brings, the survey shows 5 main benefits. Interviewees chose 3 out of 5 benefits that they think are the most important that Le Quy Don Park brings. 384 choices were made by 128 respondents, of which 97 choices were entertainment and activities. The benefit of outdoor activities accounted for 25.26%. 86 choices were “helping to improve physical and mental health”, accounting for 22.4%. Next are the benefits of reducing environmental pollution, controlling climate and creating urban landscape with 81 choices, equivalent with 21.09%. Finally, the benefit of Better community engagement accounts for 10.16% (39 choices).

Problems in the park

Regarding inadequate issues at the park, the study raises 5 main issues. Out of 5 shortcomings, respondents choose 3 out of 5 problems that they think should be prioritized to solve. 23.44% of the answers were the problem of pollution: the waste collection and treatment in the park was ineffective. 22.92% of respondents think that infrastructure is still poor, degraded, and cannot meet the needs of the people, which is a problem that needs to be overcome. Following is the problem of weak management from government agencies: The land was used for wrong purposes (17.79%); many shops were allowed to run business in the park illegally (17.45%); The percentage of tree cover is low (16.41%). When asked about the level of people's concern about the above issues, 46.1% of respondents are interested, while 15.63% do not care and 1.56% do not care at all. Thus, according to the assessment results, the awareness and concern of Thai Binh city people about the shortcomings happening at Le Quy Don Park is generally quite high. The survey also had questions about the situation of the Park in the next 5 years. There were 67.18% of the respondents saying that the park will develop in a better direction while 14.84% thought that the park will be deteriorated. The number of people thought it was necessary to improve the Le Quy Don Park was relatively high at 77.35% of the respondents. Only few respondents said that this was unnecessary, accounting for 5.47%.

Table 2: People's views on preservation and management of Le Quy Don Park

<i>People's views on park preservation and management</i>	<i>Totally disagree</i>	<i>Disagree</i>	<i>No idea</i>	<i>Agree</i>	<i>Totally agree</i>
<i>1. The issue of preservation and park management is the responsibility of state agencies and governments</i>	3,91%	8,59%	12,5%	60,94%	14,06%
<i>2. We need to sacrifice part of our income and living conditions so that the next generation can enjoy a better environment.</i>	1,56%	3,13%	33,59%	51,56%	10,16%
<i>3. The issue of preservation and park management is an issue of society, rights and responsibilities of state agencies, organizations, households and individuals.</i>	1,56%	2,34%	17,97%	53,13%	25%

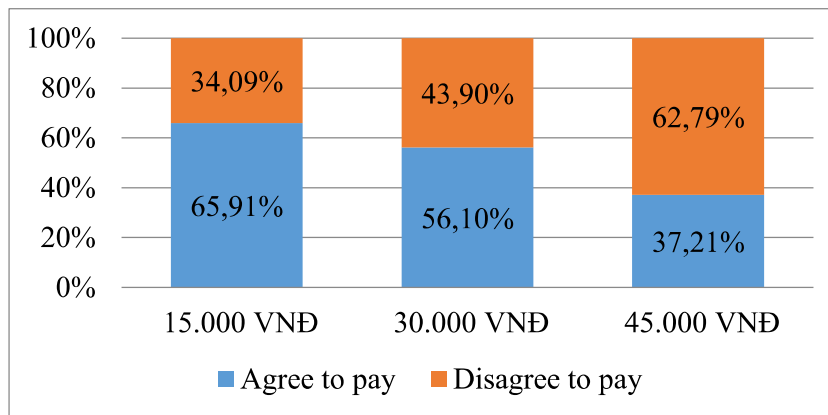
Table 2 shows that 75% of the people agreed that park preservation and management is the responsibility of state agencies, while 3.91% totally disagreed and 8.59% disagreed. More than 61% of respondents are willing to sacrifice part of their income and living conditions so that the next generation can enjoy a better environment. The percentage of people who opposed this point of view was very small, only 4.69%. People in the low-income group were also willing to spend part of their income to protect the environment.

Besides, 78.13% of the respondents agreed and completely agreed that the preservation and management of the park was the responsibility of the whole society including the state agencies, the social organizations and the community. Only a small percentage of the respondents disagreed (3.9%).

3.3. Estimated WTP for park preservation

The questionnaire gave 3 levels of quarterly payments (as the payment vehicle is quarterly waste collection service bill), which were VND 15,000, VND 30,000 and VND 45,000. Payment rates are randomly distributed to each person. Respondents should answer whether they are willing to pay the rates asked for park preservation. The number of respondents for the rate of VND 15,000, VND 30,000 and VND 45,000 were 44, 41 and 43 respectively. Figure 1 showed the percentage of the answers for each level of payment. Nearly 66% of the interviewees agreed to pay at the rate of 15,000 VND; 56.1% agree with the rate of 30,000 VND and about 63% disagree with the payment rate of 45,000 VND.

Figure 1. The rate of willingness to pay and the unwillingness to pay according to each level of payment



This rate is completely consistent with the law of demand: as the payment increases, the rate of agreeing to pay for park preservation will gradually decrease. Out of a total of 128 respondents, 60 people disagree with the level of payment questioned. All the reasons that the respondents are not willing to pay are summarized in Table 2. The average WTP is calculated as in the following formula:

$$\text{Average WTP} = \frac{\sum_{i=1}^n p_i * BID_i}{\sum_{i=1}^n p_i}$$

BID_i : The level of payments that people are asked to pay

p_i: probability of agree to pay at BID_i (0 ≤ p_i ≤ 1)

n: The number of level of payment

Thus, the average WTP was 27.1 thousand VND/quarter or VND 108,532.3 every year for each household.

Table 3 shows that the reason for the highest percentage (31.67%) that people are not willing to pay for park preservation is “I agree with the renovation and maintenance of parks, but THE GOVERNMENT MUST BE RESPONSIBLE for the entire cost because we already paid them the tax”. 19 of 62 respondents said that they have paid the tax and fees to the State and parks under the management of the City People's Committee, then the state budget must be used for the renovation and maintenance of the park. Up to 23.33% of people refuse to pay for the reason "I agree with the renovation and maintenance of the parks, but I DO NOT BELIEVE my donation will be used ONLY for this PURPOSE". There are 20% who choose the reason “I CAN'T CONTRIBUTE because I have only enough money to spend for me and my family”. These people say that there are many expenses in the family and their income is only enough to cover their daily life’s needs. 16.67% thought that “the renovation and maintenance of parks was NOT USEFUL to me”. 10 out of 60 respondents said that renovating the park would not benefit them, maybe because most of them live far away from the park and do not visit the park very often. To assess the level of certainty of willingness-to-pay of the respondents, a scale of 1 to 10 were developed, where 1 is “Very uncertain.” And 10 is “Very certain”. Most respondents are quite sure with their willingness to pay, up to 61% of respondents have a very high degree of certainty (from 8 to 10) and nearly 40% of respondents with medium certainty average (from 5 to 7).

Table 3: Reasons for unwillingness to pay for the preservation of Le Quy Don Park

Reason	Frequency	Percentage
<i>1. I agree with the renovation and maintenance of the parks, but I DO NOT BELIEVE my donation will be USED ONLY for this purpose.</i>	14	23,33%
<i>2. I agree to renovate and maintain the parks, but I CANNOT CONTRIBUTE because I have only enough money to spend for me and my family.</i>	12	20%
<i>3. I agree with the renovation and maintenance of parks, but THE GOVERNMENT MUST BE RESPONSIBLE for the entire cost because we already paid them the tax.</i>	19	31,67%
<i>4. Renovating and maintaining parks is NOT USEFUL to me</i>	10	16,67%
<i>5. Other reasons</i>	5	8,33%

3.4. Factors influencing willingness to pay for park preservation

To analyze WTP for the preservation of Le Quy Don Park in Thai Binh City, the study uses a linear regression model with WTP as the dependent variable affected by independent variables including sex (SEX), age (AGE), education level (EDU), income (INCOME), distance from housing to park (DISTANCE). The willingness to pay for any observation takes the form:

$$WTP_i = a_1 + b_1 * SEX_i + b_2 * AGE_i + b_3 * EDU_i + b_4 * INCOME_i + b_5 * DISTANCE_i + \varepsilon_i$$

In which: a_1 is the intercept; b_i (from 1 to 5) is the slope of the independent variables; ε_i is the effect of other variables not included in the model on the WTP.

The results of regression estimation of factors affecting people's willingness to pay for preservation of Le Quy Don Park are shown through the equation:

$$WTP_i = -29,8713 + 3,0568 * SEX_i + 0,1012 * AGE_i + 2,7373 * EDU_i + 0,0009 * INCOME_i - 0,7926 * DISTANCE_i + u_i$$

We see P-Value (Prob (F-Statistic)) = 0.0000 < 0.05, this result shows that the above model is suitable. Besides, the correlation coefficient R2 received the value of 0.4815, meaning that 48.15% of the variation of WTP was explained by the variable introduced into the model.

The SEX variable has a regression coefficient of $b_1 = 3.06 > 0$ and the P-Value = 0.1609 > 0.05, which shows that the gender variable is not statistically significant at the 95% significance level. Therefore, there is not enough evidence to conclude that there is a difference in affordability between men and women.

The regression coefficient of AGE variable is $b_2 = 0.1012 > 0$ and P-Value = 0.4152 > 0.05, this result shows that the age variable is not statistically significant at the 95% significance level. So it is not to conclude that age affects WTP of people.

According to the research results, the WTP depends closely on the income variable. The regression coefficient $b_3 = 2,7373 > 0$ and P - Value = 0.0000 < 0.05 show that the variable of people's education level is positively related to affordability and systematic significance. statistic at the 95% significance level. This shows that, the awareness of environmental protection and the desire to have a green, clean and beautiful environment of people with higher qualifications is higher.

Table 4: Regression models of WTP

Variable	Sign	Coefficient	P - Value
C	a_1	-29,8713	0,0076
SEX	b_1	3,0568	0,1609
AGE	b_2	0,1012	0,4152
EDU	b_3	2,7373	0,0000**
INCOME	b_4	0,0009	0,0287**
DISTANCE	b_5	-0,7926	0,029**
R- squared	0,481456		
Mean	14,29688		
F- statistic	22,65479		
Prob(F-statistic)	0,000000		

Note: **: significant at 5%

The income level has a certain influence on WTP, with the significance level of 95%, we have P-Value (income) = 0.0287 < 0.05, proving that the income variable is statistically significant. Besides, we have $b_4 = 0.0009$ with a positive sign, meaning that as income increases, our willingness to pay will also increase. This is completely consistent with the theory and similar experimental studies. In fact, when the income is high, people will pay more attention to the quality of the surrounding environment, they always want to live in a green, clean, beautiful and fresh environment, then the need to consume quality goods and services. Increased environment leads to increased affordability as well.

The influence of the distance from the house location to the park has a relatively large impact on the WTP. With P - Value (distance) = 0.029 < 0.05, this proves that the variable DISTANCE is statistically significant at the 95% level. The sign of the coefficient $b_5 = -0,793$ is negative, implying that the farther the distance from home to the park is, the lower the willingness to pay. Reality proves that the farther people are from the park, the less benefits and importance the park gives them than those who are near the park or even they will not enjoy any value. benefit that the park brings. At the same time, these people are often less concerned with the park's problems, so their affordability or may not be willing to pay because they believe that renovating and maintaining the park is not. useful to them.

Thus, out of the 5 factors included in the model, only 2 factors are not statistically significant, namely the gender variable and the age variable. The remaining variables identified as having an influence on WTP are education level, distance from home location to park, and income which also have certain effects on WTP. This is an important basis for giving orientation and proposing solutions for the management and preservation of Le Quy Don Park in Thai Binh City in particular and improving the quality of the environment in general.

4. Discussion and Conclusion

In recent years, Thai Binh city has a fast urbanization rate, so the city is focusing on research and planning to build a smart city and towards urban standards of grade I. In which, development is Environmental infrastructure, especially investment in upgrading and renovating green parks is an urgent issue in Thai Binh city in particular and urban areas in Vietnam in general. Currently, the status of Le Quy Don Park is facing serious problems such as environmental pollution, waste collection; poor and degraded facilities do not meet the needs of the people; park land is used for wrong purposes; security and order have not been guaranteed; The proportion of trees is still low, along with the weak management from government agencies. Research results show that people are aware of the benefits as well as the shortcomings that exist at Le Quy Don Park and the importance of environmental protection. People's interest in the park is also relatively high. Most of the respondents accepted to sacrifice part of their income and living conditions so that future generations could enjoy a better environment. However, despite paying great attention to environmental

protection, the role and participation of individuals and households in the preservation of the park are not fully understood. Most of the people believe that they have paid taxes to the State, so renovating and maintaining the park is the responsibility and job of the government. The paper uses the CVM method with a binary question form to estimate the people's willingness to pay for the preservation of Le Quy Don Park. The survey results showed that 68/128 (53.125%) of the subjects agreed to pay and the average WTP was estimated at 27.1 thousand VND/quarter or VND 108,532.3 every year. The people's willingness to pay depends closely on income, education level and distance from housing to parks. Specifically, income and educational attainment are proportional to WTP, while the gap is inversely related to WTP. In addition, the study does not have enough evidence to show the influence of factors such as gender and age on the affordability of Thai Binh people. From the above results, some solutions to manage and preserve the park can be recommended, such as enhancing financial resources, capital; raise awareness of the community, increase income and living standards of the people, develop regulations on park management and protection. However, since the number of observations in the article is quite small compared to the total population of Thai Binh city, a more in-depth and detailed study with a larger sample of survey is required to clearly demonstrate attitudes and abilities payment of the people for the preservation of Le Quy Don Park.

5. References

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