The Value of Urban Park: A Case Study of Taman Cilaki Bandung[1]

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ABSTRACT

Urban park, which is a part of urban green areas, provides 3 basic functions for urban communities, i.e. social functions, ecological functions, and aesthetic functions. As a city grows larger, caused by its size of population and its intensity of activities, the need/demand of green areas in the city should grow higher. However, in many major cities in Indonesia, the existence of urban park is facing a serious threat as it can be observed that the ratios of park areas to the total city area in many major cities are decreasing. These decreasing ratios are typically due to land conversion from parks to buildings. This conversion is usually based on the premise that urban park as an environmental public good has a lower, or even no economic value, compared to modern buildings. This paper wants to argue that urban parks do have values for urban communities, since parks provide the three functions mentioned above to urban communities. However, these functions are not tradable goods. Hence, the main goal of this paper is to investigate the value of urban parks for the people in urban areas. This value will be measured by how much people willingness to pay for the conservation of urban parks.

The case study in this paper takes place in Cilaki Garden or *Taman Cilaki*, Bandung. This park is widely known by Bandung inhabitants and the condition is relatively good. The urban park conservation program that is offered to the people in Bandung is a program that preserves the existence of the park and enhances its quality by increasing the quantity and diversity of the plants as well as improving the quality of park facilities. A survey asking how much people willing to pay for this program is conducted among users and non-users of this park. The survey also consists of questions related to respondent's socioeconomic backgrounds and their perceptions on urban park.

This paper employs the Contingent Valuation Method and Dichotomous Choice with Follow-up elicitation method to reveal people's willingness to pay (WTP). This paper also seeks correlations between people's WTP and their socioeconomic backgrounds and perceptions toward urban park. The results show that with the most fitted distribution underlying distribution i.e. logistic, the average monthly WTP is approximately Rp 6,017.5. This number is higher than the average monthly WTP for a river water quality program in Bandung, that is approximately Rp 3.970 (Rizani, 2002).

1. INTRODUCTION

Urban park is a part of urban green areas. According to Inmendagri No. 14/ 1988, urban green areas are defined as undeveloped lands which have urban as well as rural characteristics in the form of parks, green lands, urban forests, fields, and yards. Despite being an important aspect of urban architectural design, urban park also provides 3 basic functions for urban communities. First, urban park serves for social functions such as recreation, children play ground , education, exercising, relaxing, and socializing. Urban park also provides important ecological functions for urban environment, for example production of fresh air, dust filtration, infiltration of rain water, flood control, noise and vibration reduction. Finally, the existence of urban park has an esthetic function by giving a beautiful visual effect to the city, a particular characteristic that shapes the face of city, and an opportunity for buildings to get better sunlight.

As a city grows larger, due to its size of population and intensity of activities, the need for green areas in the city should grow higher. However, nowadays it's very hard for the people to find urban parks in their cities, not even to mention the quality of existing urban parks. In many major cities in Indonesia, most urban parks have been converted to any kinds of buildings. This conversion is usually based on the premise that urban park as an environmental public good has a lower, or even no economic value, compared to those buildings. As with any other environmental goods, urban park does not produce any revenues for government as the "owner" of the park; hence the government usually is in favor of any other buildings or developed lands than the park as an undeveloped land.

The value of an urban park however should be measured by how much benefits it gives to the community, instead of only the revenues it yields. The more benefits are given by urban park to the community, the higher is its value. Eventhough the definition of value can be very broad, it is the economic (monetary) value that dominates the basis of decision making, either by the government or community. Decision making regarding conversion of urban park as an undeveloped land to any other commer.

These benefits are usually based on monetary unit as observed by their market values. Unfortunately, the benefits given by urban park as indicated by its functions are not readily measured in monetary unit since they are not traded in market. Thus the economic value of an urban park cannot be observed directly, because what it has is non-market values. Further more, government as the manager of urban environment and community do not have informations regarding these non market values. Again, this contributes to government decision in favor of urban park conversion to buildings or other developed lands.

For the decision makers to assess optimal urban park management alternatives, the information regarding true economic value of urban park is indeed very important. In this light, a study on valuation of urban park can make an important contribute to the internalization of non-market urban park values in decision making, especially regarding allocation of public resources for protecting and improving quality of the environment.

The value of an urban park can be measured by community's preferences for urban park conservation, as reflected by their Willingness To Pay for an urban park conservation program to get the benefits of an urban park. Hence, the main goal of this paper is to investigate the value of urban park for the people in urban area by assessing people's willingness to pay for the program.

2. METHODOLOGY

2.1.WTP/WTA as a Measure of the Economic Value

The valuation of an environmental good is usually based on the monetary value that people place on it. The maximum amount of money an individual is willing to pay for obtaining benefit or avoiding a loss in most situation reflects the intensity of her preferences for such a benefit or loss. These preferences are based on the values she attaches to goods. The maximum willingness to pay (WTP) can be considered as an expression of the individual's values. Similarly, the minimum willingness to accept (WTA) can be considered as compensation for forgoing a benefit or for incurring a loss and this reflects the value of such benefit or loss.

When an individual buys an asset at market price, the price directly reveals a lower bound of her maximum WTP, i.e. that her WTP for that asset is at least equal to the price paid. Similarly, when an individual sells an asset at market price, the amount received directly reveals an upper bound of her minimum WTA for forgoing the use of such an asset. When such market does not exist, then there is no market price that reveals the lower bound of the individual's maximum WTP and the upper bound of the minimum WTA. Hence, a method is needed to obtain a monetary measure of the value individuals attach to a non-marketed asset.

Maximum WTP and minimum WTA of individuals for a change in the level of an environment asset can be measured by looking at the variations of the individual's monetary expenditure required to keep her indifferent in term of satisfaction or welfare. Maximum WTP and minimum WTA can then be taken to be monetary indicators of the individual's welfare changes. An individual may be willing to pay or accept as compensation, to obtain or avoid the following changes in the asset: (i) decrease in price; (ii) increase in price; (iii) improvement in the quantity/quality available; and (iv) degradation of the quantity/quality available. Individual's maximum WTP and minimum WTA are measured using the economic concepts of compensating variation (CV), equivalent variation (EV), compensating

surplus (CSU), and equivalent surplus (ESU). This can be viewed in **Figure 1.**

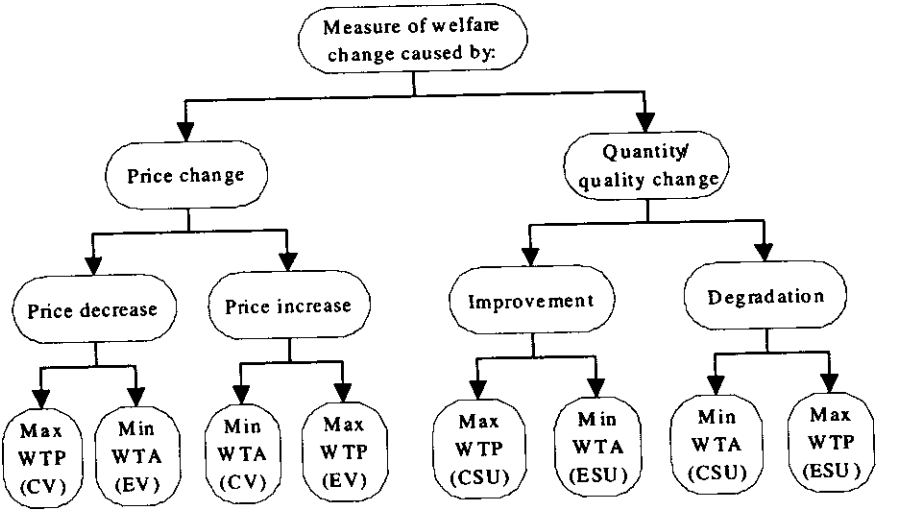


Figure 1 Measures of Max WTP and Min WTA For price and Quantity Changes (Markandya et.al., 2002)

Two alternative approaches can be used to derive the measures of a change in welfare described above:

1. Revealed preferences
   This is done by analysing the actual consumer behaviour or reactions in adjusting their consumptions in response to change in the price or quantity of an environment goods/ services and use this information to work out monetary measures of the consumer's welfare change.
2. Stated preferences
   This is done by asking the consumers directly their willingness to pay or willingness to accept for a proposed price change or for the envisaged quantity change, and uses what consumers stated as measures of the consumer's welfare change.

2.2.Stated Preference CVM (Contingent Valuation Methods)

Contingent Valuation Methods (CVM) is the most widely used among various stated preferences techniques. Basically, it consists of asking people (usually via a questionnaire or by experimental techniques) what they are willing to pay for a benefit or what are they willing to receive as compensation for the damaged caused.

The individual maximum WTP or minimum WTA compensation for an environmental change is assumed to be the value the individual attaches to such a change. The questionnaire simulates a hypothetical (contingent) market of a particular good in which individuals are asked to reveal their willingness to pay for a change (better or lower quality) in the provision of the good in question. The questionnaire also provides information an the institutional context in which the good would be provided and on the payment vehicle.

The advantages of this method (i) is applicable to all goods and services and it is the only possible technique for the evaluation of non-use values; (ii) does not require the huge amount of data necessary for the other techniques; and (iii) flexible that it can be treated at different levels of complexity according to the time and financial resources and the specific format of the question used to capture the individual's value judgement. But this method also raises criticism regarding its accuracy and reliability in revealing consumer preferences. The major criticism concern the biases inherent in the techniques, i.e. strategic bias or the free-rider problem, starting point bias, information bias, vehicle bias, and hypothetical bias. There is also disparity between willingness to pay and willingness to accept that emerges in empirical studies of CVM.

2.3.CVM: Dichotomous Choice with Follow-Up

For the last several years, dichotomous choice contingent valuation method have gained popularity due to their advantages for avoiding many of the biases known to be inherent in other value elicitation formats (Cameron, 1994). This elicitation method can be highly statistically inefficient in that vastly larger numbers of observations are required to identify the underlying distribution of resource value with any given degree of accuracy. Dichotomous choice with follow-up is a variant of this method. In this elicitation format, people are asked about their willingness to pay a certain amount of money which should be answered by "yes" or "no". Based on this answer a second threshold is offered; if they say "yes" to the first offer, an amount of about twice the first is offered; if they say "no" to the first offer, an amount of about half the first is offered. This method which is intended to reduce inefficieny was first proposed and implemented by Carson, Hanemann, and Mitchell.

In this paper, the first and second responses are assumed to be motivated by an identical unobserved resource value. Maintaining the same hypotheses, Mitchell & Carson (1993) use survival analysis to analyze this data, which is based on Weibull distribution. Another approach by Cameron (1994) employs bivariate probit analysis based on the assumption that the first and second offer may come from a different underlying resource value.

This paper employs dichotomous choice with follow-up (DCF) contingent valuation method to estimate respondent's willingness to pay for improving the quality

Sosioeconomic information of respondents is required to facilitate interpretation of WTP in the socioeconomic context such as gender, age, education, etc. Scenario design provides a clear and careful description of the environmental good that is the object of the valuation, urban park in this case. It also provides information on its changes under given condition, the impact of the change on the users, and the types of policies to secure these policies. Another important issue in implementing CVM is the choice of payment vehicle. One procedure for determining the most appropriate payment vehicle is to carry out a pilot study in which several alternatives are tested. The analysis of the results allows for identification of the payment method with which respondent are most familiar, and the one most preferred by them.

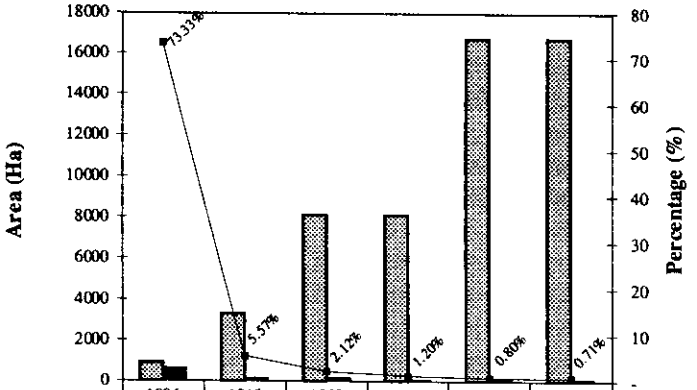
The next two steps are survey implementation and data analysis, and the last step is WTP estimation. Estimation method depends upon the elicitation format chosen. This study employs dichotomous choice with follow-up elicitation procedure which usually required survival data analysis or probit analysis (Mitchell & Carson, 1993).

3. TAMAN CILAKI AS A CASE STUDY

3.1. Urban Parks in Bandung

As in many major cities of Indonesia, green area in Bandung is decreasing, in contrary to the expansion of city area as shown by the following figure.

Ratio of Green Area to City Area of Bandung (1906-2003)



	1906	1945	1968	1983	1992	2003
City Area (Ha)	900	3305	8098	8098	16729	16729
Green Area (Ha)	660	184	172	97	134	119
Green Area Percentage	73.33	5.57	2.12	1.20	0.80	0.71

Figure 3 Ratio of Green Area to City Area of Bandung (1906-2003)
Source : Suryadini (1994), The Agency for Parks and Cemetary, City of Bandung (2003).

The standard of Lancashire City Council stated that each person needs an urban park of 7-11,5 m^2 to supply their need of clean air. Based on that standard, about 2,5 millions of Bandung inhabitants need at least 1750 ha of urban park and that is about 15 times of the real condition currently.

Decreasing urban park area in Bandung is caused by conversion of land use to buildings like gas station, government office, market, houses, hotel, etc. If this is becoming a trend, it is afraid that Bandung will permanently loose all the benefits provided by the existence of urban parks. So far, it has been widely known that the community has lost more public spaces for doing their activities and socializing, and experienced increasing temperature, noise, air pollution, as well as flood risk. Eriawan (2003) viewed that urban park has changed not only quantitatively, but also qualitatively. Some urban parks are no longer used as designed by the community. This deviation of urban park use is affected by social economic condition of the community, as well as preference of urban park user to the desired urban park condition.

Furthermore, Suryadini (1994) argued that changes in quantity and quality of urban parks in Bandung cannot be separated from government policy in green areas management. Designed as Garden City, during 1906-1942 the City of Bandung had many green areas in a very good condition. However, further development program had ignored the existence of urban parks. Not until 1983 that the government declared a slogan of Bandung Berhiber (Bandung that was clean, green, and full of flowers) and established The Agency for Parks of Bandung, then green areas regained attention from the government. Differences in government policies toward green areas management were much attributed to the attitudes and views of government regarding green areas. On the other hand, people's attitude toward green areas had also affected by changes in their social economic condition as well as government policy on green areas. Thus, there was a reciprocal connection between decision making and changes in community's social economic condition.

3.2. Taman Cilaki

Taman Cilaki urban park consists of 3 small adjacent parks, which are Cilaki Atas Park, Cilaki Tengah Park, and Cibeunying Park, that account for about 3 hectares of area. Taman Cilaki is widely-known urban parks in Bandung. It is located strategically around an upper class settlement, near Gedung Sate (historical landmark of Bandung) and Gasibu sport field. In weekends, the park is visited by hundreds of users doing all kinds of activity, while on work days the park is usually quite serene with only tens of people relaxing.

Taman Cilaki is chosen as a case study because :

a. It is an urban park which most people feel quite familiar with so it will be easier for the respondents to reveal the benefits of urban park conservation program that they perceive to be experienced.

b. Taman Cilaki is a public space that has been used by people to do a large range of activities within. Consequently, this will allow for identification of the Use Values of urban park as components that are usually easier to be perceived by the people compared to the Non Use Values.

Those considerations are important since valuation of environmental goods is a new and very unsual concept for most people. It is expected that the selection of Taman Cilaki as a Case Study will familiarize or introduce people to the concept of non-market values of environmntal goods and hopefully reduce the non-response of respondents in the survey.

4. SURVEY IMPLEMENTATION

4.1. Objective

The purpose of the survey is to establish monthly WTP (in Rp) value for conservation program of Taman Cilaki. Respondents consist of users and non-users; by users we mean people who use Taman Cilaki frequently or at least that are currently using it at the time the survey is conducted; by non-users we mean those who never use Taman Cilaki.

4.2. Questionnaire Design

The questionnaire used in this study consists of 4 parts i.e.:

1. Introduction
   In this part respondents are provided with information about the importance of urban parks and the past and present condition of urban parks in Bandung and what should be. It is hoped that respondents can understand the urgent problems concerning the urban parks in Bandung, including Taman Cilaki.

2. Respondents's Socioeconomic Information
   In this part respondents are asked about their gender, sex, age, education, occupation, how long they have been living in Bandung, how far their residents from Taman Cilaki, how often they pass and use Taman Cilaki, and what they do in Taman Cilaki.

3. Scenario Design and Payment Vehicle
   In this part respondents are provided with information about the hypothetical scenario of conservation program of Taman Cilaki and the payment vehicle to raise fund to afford that scenario. The proposed payment vehicle is through membership fee of "Friends of Urban Parks" that is paid monthly. Friends or Urban Parks is a hypothetical organization proposed to manage such program.

4. WTP Statement
   This study employs dichotomous choice with follow-up in which respondents are asked about their willingness to pay for a conservation program. Three level of first offer are

used i.e. Rp5.000,-, Rp7.500,-, and Rp10.000,-, which are picked randomly for each respondent. Based on responses to first offer, second offer is asked. If respondent say "yes" to the first offer, second offer of about twice the first is asked i.e Rp10.000,-, Rp15.000,- and Rp20.000,-. If respondent say "no" to the first offer, second offer of about half the first is asked i.e Rp2.500,-, Rp4.000,- and Rp5.000,-.

4.3.Survey and Data Analysis

Survey was conducted in January 2004, using non-probabilistic sampling technique i.e. purposive sampling. Respondents in user category were picked from people who were currently using Taman Cilaki at the time survey was conducted while non-user respondents were picked from various socioeconomic background, with the total amount of 125 respondents of which 23 questionnaires are invalid due to incomplete answer.

Data analysis starts with descriptive statistics about respondents profile and respondents responses to the threshold offered. Correlation analysis is conducted afterward to seek correlation between discrete responses and socioeconomic characteristics. And finally, WTP is estimated using respondents discrete responses with several underlying assumption about each response and distribution.

5. RESULT AND DISCUSSION

5.1.Respondents Profile and Perception on Taman Cilaki

Most of respondents are male (67,65%), with education of high school or higher education (more than 90%), students (48%), and monthly expense of less than Rp 500.000,- (35,29%). The majority of respondents also has a house with a distance of > 5 km from Taman Cilaki and has lived in Bandung for more than 20 years. The survey shows that 69 % of respondents has visited Taman Cilaki (park users) and most respondents' visit frequency is once a month (41%) using private or public transportation. During their visit, the majority of respondents do various passive and active activities not more than 2 hours. On this ground, most repondents do not have a very intensive interaction to Taman Cilaki, in term of frequency and duration of visit.

To gain respondents perception on Taman Cilaki quality, the questionnaires use a Likert scale of 1-5 where 1 represents a very bad condition and 5 reflects a very good condition. The average rate is 2,717 or slightly below mediocre. Respondents were also asked to rank 4 aspects of urban park quality (environmental quality, facilities, aesthetic quality, and safety), based on aspects that were most important of urban park in general and aspects that needed to be improved to enhance Taman Cilaki quality. The result was then processed using Borda Method that converted the rankings into scores. The aspect with the biggest score (the highest rank) is the one that has to be given priority.

Table 1 Respondents Perception on Quality Aspects Based on Most Important Aspects of Urban Park in General and Aspects to be Improved in Taman Cilaki

Quality Aspects	of most importance in urban park in general		to be improved in Taman Cilaki	
	Score	Rank	Score	Rank
Environmental quality	209	1	184	2
Facilities	148	2	223	1
Aesthetic quality	117	4	173	3
Safety	138	3	142	4

Respondents think that the most important aspect in urban park is environmental quality, but aspect that needs to be improved most of all is facilities. On this ground, respondents believe that environmental quality in Taman Cilaki is quite good as observed by vegetations that grow well in the park. The existing facilities are park fence, conblock pedestrian pathway, iron bench, and a bridge over the river that runs through the park. However, the determination of appropriate facilities to be improved needs a further study.

5.2.WTP Analysis

The survey indicates that 70,6 % of respondents are wiling to pay for urban park conservation program. The percentage is similar for both user and non-user respondents. Of all socioeconomic and perception variables in the questionnaire (age, sex, education level, occupation, monthly expense, house distance from Taman Cilaki, length of stay in Bandung, park user or non-user, visit frequency, transportation mode, duration of visit, and perception on park condition), the significant variable is only education level with a small corelation value (0,097) for total respondents. For user respondents, education level is also the only significant variable with a correlation value of 0,410; while for non-user respondents there are no significant variables.

For respondents who are not willing to pay for the conservation program, they state that the reasons are : "government should be responsible for full funding of the program" (34%), "lack of trust in the proposed agency " (26%), "increasing living cost" (21%), and "others" (19%).

This paper employs survival data analysis to dichotomous choice with follow-up data under assumption that the first and second response come from the same true underlying value. Descriptive statistics of data is as follows:

Table 2 Descriptive Statistics

Description	Mean	Std. Dev.
1st Offer	7,255	2,006
2nd Offer	5,397	3,898
Discrete response to first question (1=yes, WTP amount; 0=no, not WTP)	0.176	
Discrete response to second question (1=yes, WTP amount; 0=no, not WTP)	0.794	
Joint Frequencies of Discrete Responses		
1st Response=1 and 2nd Response=1	0.049	
1st Response=1 and 2nd Response=0	0.127	
1st Response=0 and 2nd Response=1	0.745	
1st Response=0 and 2nd Response=0	0.078	

The table shows that most respondents reject the first offer. Nevertheless, after the starting point is decreased to half of the first offer, most respondents accept the second offer.

A comparison is made between first response only and pooled data (first and second response simultaneously). Three underlying distributions are used: normal, weibull, and logistic. Using log-likelihood estimator, the result is as depicted in **Table 3**. It is shown that the standard error of estimate with pooled data is smaller than that with only first-response data. This result is in accordance with US Government recommendation on CVM use that the use of single dichotomous question (as with first-response data only) needs at least 1000 respondents (Markandya et al, 2002). Consequently, estimate from the first-response data is not robust enough to be taken as respondents WTP.