

**A PRELIMINARY STUDY OF  
NON USE VALUE OF THE SIAK RIVER BASIN**  
(Studi Pendahuluan Penghitungan Nilai Bukan Manfaat  
Sungai Siak)

By/Oleh:

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**ABSTRACT**

The objective of this paper is to study the intrinsic value or non use value of the Siak River Basin, especially the existence value and the bequest value. The research used CVM (Contingent Valuation Method), with a survey conducted to have WTP (the willingness to pay). This method used total benefit technique as a base to calculate the willingness to pay. The results showed that socio economic profile of Siak River was noted by 31 to 40 years old respondents with low educational level (mostly unfinished elementary degree), 11 to 20 years experience, and the average of annual income was IDR 8,600,748 per respondent. While total non use value at the Siak River Basin was IDR 320,026,519 per year, with existence value was IDR 101,129,717 per year and bequest value was IDR 218,896,802 per year. The results also showed that development in the educational sector should be taken into account as a set of resource management option. Better educational level along with better resource condition will give better perception for the resource sustainability. Meanwhile, environmental degradation level is also indicated by the low existence value.

**ABSTRAK**

Tujuan dari tulisan ini adalah menghitung nilai intrinsik sumberdaya atau non use value dari sumberdaya Sungai Siak, terutama nilai keberadaan (existence) dan nilai pelestarian (bequest) sumberdaya. Penelitian menggunakan survey dan teknik CVM (contingent valuation method) untuk mendapatkan nilai kesediaan membayar dari responden atau WTP (willingness to pay). Metode ini menggunakan teknik total manfaat sebagai dasar dalam menghitung besaran kesediaan membayar. Hasil penelitian menunjukkan karakteristik sosial ekonomi responden, ditandai sebagian besar responden berumur antara 31 hingga 40 tahun dengan tingkat pendidikan rendah (umumnya tidak tamat sekolah dasar). Pengalaman usaha responden berkisar antara 11 hingga 20 tahun dan pendapatan rata rata responden sebesar Rp 8.600.748 per tahun. Hasil analisis juga menunjukkan besaran total-non use value sebesar Rp 320.026.519 per tahun, terdiri dari nilai keberadaan (existence) sebesar Rp 101.129.717 per tahun dan nilai pelestarian (bequest) sebesar Rp 218.896.802 per tahun. Hasil penelitian juga menunjukkan bahwa pengembangan pendidikan harus menjadi salah satu bagian yang tidak terpisahkan dari opsi pengelolaan sumberdaya. Tingkat pendidikan yang lebih baik dan diiringi oleh lingkungan sumberdaya yang juga lebih baik akan memberikan persepsi yang lebih baik terhadap pentingnya keberlanjutan sumberdaya. Hal lainnya juga menjadi catatan bahwa rendahnya nilai keberadaan (existence) menjadi salah satu indikasi dari telah semakin terdegradasinya sumberdaya itu sendiri.

**Keywords:** Non Use Value, CVM, Siak River

**Kata kunci :** Nilai Non Use, CVM, Sungai Siak

## I. BACKGROUND

Natural resource highly regards for the direct economic value or the instrumental value, while the intrinsic value is often forgotten. It is true that instrumental value of the resource could be taken into account as a base of management option to resolve environmental degradation problems (Freeman III, 2003 in Adrianto, 2006). However, the resource management objectives should be specifically determined for each resource used. The problems always occur whenever the specific objectives are failed to determine. The problems will be more complex at common pool resource with multi resource users.

Siak River is one of the common pool resource which has 287.5 Km length with average width is 90 m and 16.5 m depth. Resource used at Siak River is mostly for transportation, plantation and fisheries activities (Koeshendrajana *et al.*, 2008). Current fisheries activity is mostly capture fisheries at the upstream due to low fish stocking in the middle stream in relation to highly polluted and water degradation. Fishing gears are varied and generally each fishers use different gears with 3 to 5 days per trip.

Siak River has highly pollution status and affected to decrease fisheries activity in years. It is difficult to develop resource management option, especially for fisheries, based on the resource instrumental value due to low direct use value of the resource (Koeshendrajana *et al.*, 2008). Therefore, it is important to study the intrinsic value of the resource for knowing the level of community perception of the Siak River resource. Intrinsic value is related to the perception, especially the perception of how important the resource not in term of direct economic value. The objective of this paper is studying the intrinsic value or non use value of Siak River basin, especially the existence value and the bequest value.

## II. METHODOLOGY

The research was used CVM (Contingent Valuation Method), with a survey were conducted to have WTP (the willingness to pay). This method used total benefit technique as a based to calculate the willingness to pay. While the correlation between WTP and respondents' characteristics were predicted with the Equation 1.

$$WTP_i = \beta_0 + \sum_{i=1}^n \beta_i X_i \quad \dots\dots(1)$$

where;

WTP<sub>i</sub> = The willingness to pay of respondents

X<sub>i</sub> = Respondents' characteristics, such as educational level, ages, experiences, incomes (Grigalunas and Congar, 1995).

## III. RESULTS AND DISCUSSION

### 3.1. Socio Economic Profiles

The results show that the ages in research's site scales between 21 to 50 years old with the highest scales is 31.25 % between 41 to 50 years old and the lowest scales is 3.1 % less than 21 years old. It indicates that most of the respondents in the research site, especially in the fisheries activity, are in the unproductive level (**Figure 1.a**). While respondents' educational level is ranging from unfinished elementary to unfinished bachelor degree (**Figure 1.b**), but in general have a low educational level which is unfinished elementary school (67.74 %). Though the highest educational level is unfinished bachelor degree but has a low percentage (3.23%).



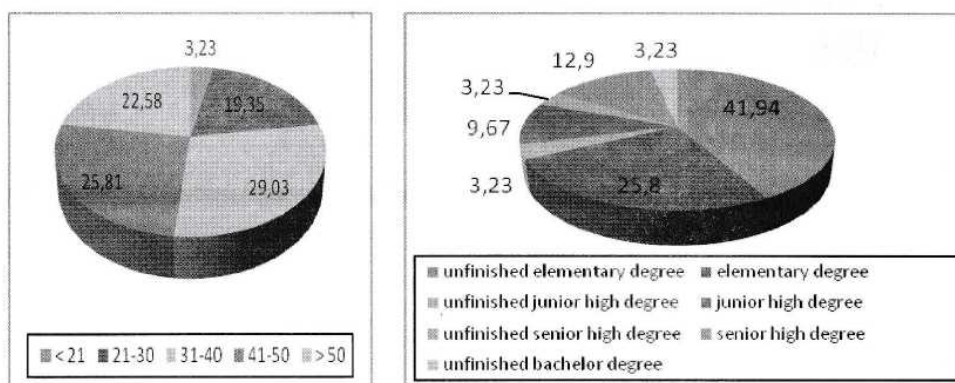


Figure 1. The Respondents' Ages (a) and Educational Level (b) at Research Site

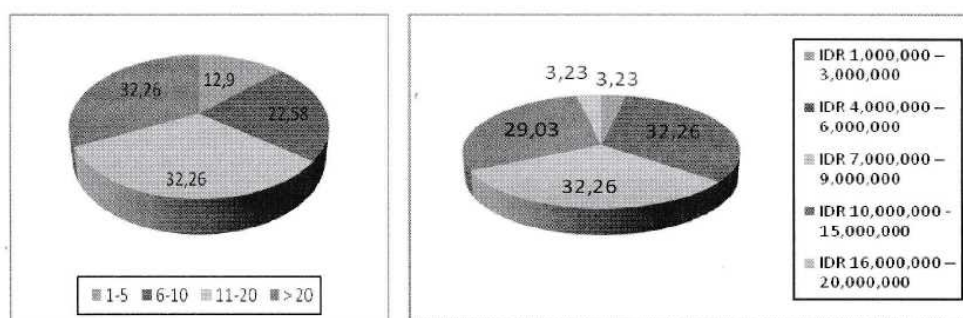


Figure 2. The Respondents' Experience (a) and Annual Income (b) at Research Site

Respondents' experience regarding fisheries activity is ranging from 1 to 20 years (Figure 2a). The highest percentage is 32.26 % for 11 to 20 years experience and also > 20 years experience, while the lowest experience is 12.9 % for 1 to 5 years experience. Figure 2 b also shows that respondents' income per year with the average income is IDR 8,600,748 per year per respondent.

### 3.2. Non Use Value

Total non use value at Siak River Basin is IDR 320,026,519 per year, with existence value is IDR 101,129,717 and bequest value is IDR 218,896,802. The result is influenced by the questionnaires which were designed to get the willingness to pay of the respondents.

The existence value's questionnaire was designed with the willingness to pay for surveillance in destructive fishing methods or the willingness of respondents to re-visit Siak River basin whenever the respondents no longer lived in the sites for some period of times. While the bequest value's questionnaire was designed with the willingness to pay of the respondents to sacrifice their current income for the benefits of the next generation, such as contributing in re stocking, willingness to save some of fishing grounds untouched and others. Generally, respondents were more willing to pay for the bequest value rather than existence value. It indicates that respondents hopes that the next generation will have more benefits from the resource rather than what they have today.

### 3.3. Existence Value

The results show the perception information of community about the existence value of Siak River is IDR 101,129,717 per year or IDR 59,244 per respondent per year. The Equation 2 is used to determine the existence value of the Siak River.

It shows that the existence value of Siak River which was given by the respondents will be increased along with the increasing of respondent's revenue

and experience in resource management. However, the level of educations and also ages of the respondents gave negative results to the equation. It is believed that the low educational level (the average is only at unfinished elementary educational level) will give negative results to the respondent's perception regarding the existence value. It has direct corresponding to the ages which also gave a negative result to the equation. Most of the respondent is old with the average is 42 years old and most of them also has a low educational level.

$$\begin{aligned} \ln WTP = & 9.39 - 0.2 \frac{1}{n} \sum_{i=1}^n \ln E - 0.41 \frac{1}{n} \sum_{i=1}^n \ln A + 0.18 \frac{1}{n} \sum_{i=1}^n \ln XP \\ & + 0.18 \frac{1}{n} \sum_{i=1}^n \ln I \dots \dots \dots (2) \end{aligned}$$



Figure 3. Sampling Sites of Siak River

### 3.4. Bequest Value

While the results show that the bequest value is IDR 218,896,802 per year or IDR 128,235 per respondent per year. The Equation 3 is used to determine the bequest value of the Siak River.

$$\begin{aligned} \ln WTP = & 8.99 + 0.04 \frac{1}{n} \sum_{i=1}^n \ln E \\ & + 0.51 \frac{1}{n} \sum_{i=1}^n \ln A + 0.34 \frac{1}{n} \sum_{i=1}^n \ln XP \\ & - 0.004 \frac{1}{n} \sum_{i=1}^n \ln I \dots \dots \dots (3) \end{aligned}$$



Bequest value of Siak River indicates the willingness to pay of respondents regarding their willingness to participate in resource sustainability. The results show that the higher educational levels, ages and experiences the more understanding regarding resource sustainability importance and in the end will lead to the more willingness to participate in resource sustainability. Respondents are likely to choose to sacrifice for paying regarding re-stocking, surveillance and developing of reservation's sites respectively with a hope that their next generations will have the benefits.

However, it also shows that income has a slightly negative result to the willingness to pay. Based on interview results, most of respondents were slightly reluctant to sacrifice for contributing in resource sustainability due to their low income (IDR 716,729 per year in average). However, when the respondents were given the simulation in interview with higher income they have then they were willing to contribute in resource sustainability.

Higher bequest value compares to existence value indicates that the community has high expectation to sustain the resource in long terms. The major reason behind the community's perception, especially fisheries community, is due to the factual condition of the Siak River basin which could not give more contribution as their livelihoods any longer, hile alternative livelihoods are scarce. They hope that in the future the condition will be better or there will be better alternative livelihoods.

#### IV. CONCLUDING REMARKS

Socio economic profile of Siak River is noted by unproductive ages (ranging from 31 to 40 years old) with low educational level (mostly unfinished elementary

degree), 11 to 20 years experience, and the average of annual income is IDR 8,600,748 per respondent. While total non use value at Siak River Basin is IDR 320,026,519 per year, with existence value is IDR 101,129,717 per year and bequest value is IDR 218,896,802 per year.

The bequest value will be the major interesting entry point for the sake of resource sustainability as it shows above that it gave the highest in total resource non-use value. It is also believed that development in the educational area should be taken into account as a set of resource management option. Better educational level along with better resource condition will give better perception for the resource sustainability. Meanwhile, the environmental degradation level is also indicated by the low existence value.

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