THE MISI RURAL DEVELOPMENT PROJECT
AND
AREA'S RECREATIONAL VALUE BASED ON CONTINGENT VALUATION METHOD

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ABSTRACT: In the long term, the Industrial Revolution had caused the welfare increases in the urban areas and decreases in the rural areas. The weak rural society who live with the nature had started to exhaust and destroy the natural resources excessively. To alleviate the pressure upon natural resources and increase the welfare level Rural Development Projects had been put on the agenda by the Developing Countries. However, in developing countries, environmental benefits and costs have not included the project analysis, furthermore environmental evaluation has been desired a luxury concept. The aim of this study is to put forward the environmental impacts of the rural development project prepared for the Misi Settlement which has recreational areas and natural beauties, and shed light on local governments.

Keywords: *Rural society, rural development projects, environmental evaluation*

ÖZET: Sanayi devrimi, uzun dönemde kentsel alanlarda refah artışlarına, kırsal alanlarda refah azalmalarına neden olmuştur. Doğa ile birlikte yaşayan yoksul kırsal toplum doğal kaynakları aşırı bir şekilde tüketmeye ve yok etmeye başlamıştır. Doğal kaynaklar üzerindeki baskıyı azaltmak ve kırsal kesimin refah düzeyini yükseltmek için kırsal kalkınma projeleri gelişmekte olan ülkeler tarafından gündeme alınmıştır. Ancak gelişmekte olan ülkelerde, proje değerlemede çevresel fayda ve masraflar proje analizine katılmamakta, ayrıca çevresel değerleme lüks bir kavram olarak görülmektedir. Bu çalışmanın amacı, Bursa yakınındaki doğal güzelliklere ve Rekreasyon alanlarına sahip Misi Yerleşimi için hazırlanan kırsal kalkınma projesi ve çevresel etkilerini ortaya koymak ve yerel yönetimlere ışık tutmaktadır.

Anahtar Kelimeler: *Kırsal toplum, kırsal kalkınma projeleri, çevresel değerleme*

1. Introduction

Every type of economic activity affects the environment to some extent; they are intrinsically linked. Changes in the economy in the form of changes in technology, consumption patterns, investment levels, international trade links, spatial relocation, macroeconomic policy, etc., will all have an impact, sometimes profoundly, upon the natural environment. This situation in turn will affect human well-being (Kula 1994: 5-6).

In developing countries, the idea that environmental control is a luxury that can wait for another decade is no longer valid (Çetin and Rehber, 1999). Environmental

problems are most acute in developing world and sometimes the survival of thousands of poor people depends upon the quality of the environment they live in (Hartwick and Olewiler, 1986).
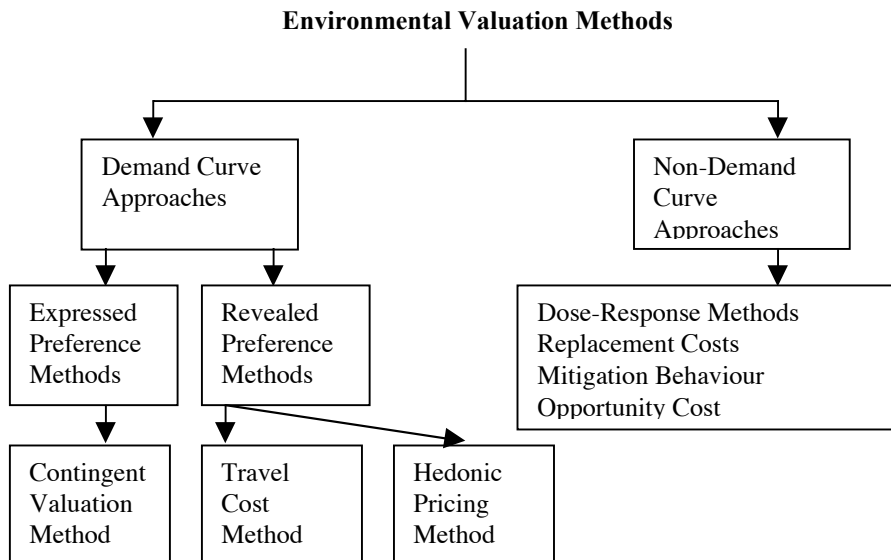
Today, environmental damage now has an important part to play in environmental economics for some of reasons:

i.The valuation makes it clear that the environment is not an infinite and free resource, even in the absence of well-established markets. Especially when projects are making substantial claims on the environment, the valuation of such claims signals the growing scarcity of the environmental input.

ii.Development proposals that are in conflict with conservation will be judged from a better perspective when all environmental impacts are considered.

iii.When restoration of an environmental quality is considered, valuation can provide a true picture about the economic worth of projects, the performance of a region or the nation as a whole.

2. Economic Valuation Methods and the Concept of Contingent Valuation Method

2.1. Economic Valuation Methods

A number of techniques are available to value environmental goods in economic terms. Figure 1 shows these techniques and illustrates how they are related. Methods to value the environment can be broadly divided, into two categories: those which value a commodity via a demand curve; and those which do not (Turner and Pearce, 1994: 115-116).

Environmental Valuation Methods

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                    Environmental Valuation Methods
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              ┌───────────────────┴───────────────────┐
              ▼                                         ▼
      Demand Curve                              Non-Demand
      Approaches                                Curve
                                                Approaches
         │                                          │
    ┌────┴────┐                                     ▼
    ▼         ▼                          Dose-Response Methods
 Expressed  Revealed                     Replacement Costs
 Preference Preference                   Mitigation Behaviour
 Methods    Methods                      Opportunity Cost
    │         │      ╲
    ▼         ▼       ╲
 Contingent Travel    Hedonic
 Valuation  Cost      Pricing
 Method     Method    Method
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Figure 1. Monetary Evaluation Methods for Environmental Goods

Non-market demand approaches have traditionally been used to assess the cost of environmental impacts, and hence to determine policy responses by policy makers in Developed Countries (Clawson and Knetsch, 1966). Those methods are: *dose response approach, preventative expenditure approach, replacement cost, mitigation behaviour, opportunity cost methods.*

Demand curve approaches take part in expressed prefence and revealed preference methods. The demand for environmental goods can be revealed by examining the purchases of related goods in the private market place. These may be complementary goods or other factor inputs in the household's production function. On the other hand, the demand for environmental goods can be measured by examining individual's expressed or stated preference for these goods relative to their demand for other goods and services (Baumol and Oates, 1988).

There are a number of revealed preference methods. The *travel-cost method* (TCM) is primarily employed to estimate the demand or marginal valuation curve for recreation sites (Douglas and Taylor, 1999:81-92). Entry to many recreation sites is free of charge. However, individuals need to purchase a private good, to gain access to the recreation site. The demand for the recreation site can therefore be estimated by observing how the number of visits to the site varies according to the price of this private good: greater distances incur higher transport costs and hence lower numbers of visits, *ceteris paribus*.

The *hedonic price method* (HPM) is based on consumer theory which postulates that every good provides a bundle of characteristics or attributes (Lancaster 1966). HPM attempts to evaluate environmental services, the presence of which directly affects certain market prices. For instance, house prices are affected by many factors: number of rooms, size of garden, access to workplace, etc. Of course, one important factor will also be local environmental quality. If we can control for the non-environmental factors, e.g. by looking at houses with the same number of rooms, similar garden size, similar accessibility etc., then any remaining difference in house price can be shown to be the result of environmental differences.

Expressed preference techniques avoid the need to find a complementary good (travel or housing), or a substitute good (compensatory wage rate), to derive a demand curve and hence estimate how much an individual implicitly values an environmental good or safety feature. Expressed preference methods ask individuals explicitly how much they value an environmental good (Garrod and Willis, 1999: 20-21).

2.2. The Concept of Contingent Valuation Method
Contingent Valuation is a method of estimating the value that a person places on a good. The approach asks people to directly report their willingness to pay (WTP) to obtain a specified good, or willingness to accept (WTA) to give up a good, rather than inferring them from observed behaviours in regular market places.

Because it creates a hypothetical marketplace in which no actual transactions are made, contingent valuation has been successfully used for commodities that are not

exchanged in regular markets, or when it is difficult to observe market transactions under the desired conditions.

Although it is certainly possible to employ contingent valuation for commodities available for sale in regular marketplaces, many applications of the method deal with public goods such as improvements in water or air quality, amenities such as national parks, and private non-market commodities such as reductions in the risk of death, days of illness avoided or days spent hunting or fishing.

Contingent valuation has proven particularly useful when implemented alone or jointly with other valuation technique for non-market goods, such as the travel cost method or hedonic approaches. It remains the only technique capable of placing a value on commodities that have a large non-use component of value, and when the environmental improvements to be valued are outside of the range of available data (Jakobsson and Dragun, 1996).

The goal of contingent valuation is to measure the compensating or equivalent variation for the good in question. Compensating variation is the appropriate measure when the person must purchase the good, such as an improvement in environmental quality. Equivalent variation is appropriate if the person faces a potential loss of the good, as he would if a proposed policy results in the deterioration of environmental quality. Both compensating and equivalent variation can be elicited by asking a person to report a willingness to pay amount. For instance, the person may be asked to report his WTP to obtain the good, or to avoid the loss of the good. Formally, WTP is defined as the amount that must be taken away from the person's income while keeping his utility constant:

$$V(y - WTP, p, q_1; Z) = V(y, p, q_0; Z) \qquad (1)$$

where V denotes the indirect utility function, y is income, p is a vector of prices faced by the individual, and q_0 and q_1 are the alternative levels of the good or quality indexes (with $q_1 > q_0$, indicating that q_1 refers to improved environmental quality).
Willingness to accept for a good is defined as the amount of money that must be given to an individual experiencing a deterioration in environmental quality to keep his utility constant:

$$V(y + WTA, p, q_0; Z) = V(y, p, q_1; Z) \qquad (2)$$

In equations (1) and (2), utility is allowed to depend on a vector of individual characteristics influencing the trade-off that the individual is prepared to make between income and environmental quality. An important consequence of equations (1) and (2) is that WTP or WTA should, therefore, depend on (i) the initial and final level of the good in question (q_0 and q_1); (ii) respondent income; (iii) all prices faced by the respondent, including those of substitute goods or activities; and (iv) other respondent characteristics. Internal validity of the WTP responses can be checked by regressing WTP on variables (i)-(iv), and showing that WTP correlates in predictable ways with socio-economic variables.

In theory, absent income effects and when WTP is a small fraction of income, WTP and WTA for a given commodity should be approximately equal. However, a number of CV studies have found that WTA is often much larger than WTP for the same commodity.

3. The Misi Project and Model

With the industrialization, that the investments being made for rural areas decrease is the terms that developing countries have to solve it. So, rural development projects had been practiced with the aim of preventing the immigration from rural areas to urban areas and providing to develop the rural side.

3.1. The Misi Settlement and Rural Development Project

In spite of these negative progresses. Misi is an old settlement which did not lose its traditional charecteristics and green fabric. But, that residences are weak in the region threats the Misi Settlement and recreational areas. In this point, Bursa Metropolitan Municipality decided to make a project which will protect the historical - green fabric and provide to increase the welfare level of the region. However, it did not include the benefit/cost analysis **environmental costs and benefits**.

Misi settlement is far away 15 kilometres from Bursa province centre and at the western side. In addition, it is a natural recreational area which is surrounded with four hills and forests. Following are geographic charecteristics of the region:

Height from sea level	:	340 metres
Average heat	:	0-36 °C
Settlement are	:	15 hectares
Population	:	1372
The number of house	:	260

3.2. Model

In order to apply Contingent Valuation Method (CVM), it is necessary to examine interviews or surveys using questionnaires to drive expression of a willingness to pay by the individual for some quantity of a good (benefit) via some payment mechanisms.

129 surveys were applied by the Uludag University Agriculture Economics Department Students. Respondents were selected by random sampling. This number is sufficient for statistically significant analysis considering the total effected population of 1372. The surveys were conducted between 18.00 p.m. and 21.00 p.m. Because landlords generally have been these time range in the Misi Center. The survey consists of three sections and a total of 40 questions. There are 5 demographic questions in the first section. The second section inquires about individual's opinions about his/her environment terms. The positive and negative opinions, and expectations about the project are asked in the third section. The questions which is about "willingness to pay" and "willingness to accept" are also in this section. In the Turkey, rural side has got a quite closed and strange socio-economical and culturel structure. So that, residences have given the surveyer the cold shoulder. Furthermore, they have considered the scientific survey study as a "taxation survey". It was given the agricultural extension service to break this belief

and conduct the data fit. Survey was effectively prepared to remove the doubts regarding reliability of the data. For instance, in the first section, it was asked to respondents how much they have land and how much they have agricultural production cost per year. In the next section, it was directly asked to the respondent about his income. Thus, it was tried to be sure date. It was made crosswise verifications for other indipendent variables.

WTP question is: "There will be a rural development projects in your region, and your welfare levels and incomes will increase thanks to this project. But it will also be environmental quality loses such as the congestion of car and human, high rate chemical use, infrastructure constructions etc.. In this situations, how much money willingness to pay for this project" ?

After the survey study, statistical analysis that explain WTP was practiced by "The Statistica Statistical Analysis Software" as following list:

- Specification of the maximum model
- Specification of a criterion for selection model
- Specification of a strategy for applying the Criterion
  *Normal procedure
  *Stepwise elimination procedure
  *Backward elimination procedure

The ordinary least squares statistical method is used to estimate the relationship of total annual benefit to the characteristics of households and resource. The objective of the statistical analysis is the estimation of the coefficients, and variables that provide the best estimates of WTP. Following model was used to estimate WTP:

$$Y_i = a + \alpha_1 \beta_1 + \alpha_2 \beta_2 + ... + \alpha_n \beta_n \qquad (3)$$

I   =1, N
Y_i =WTP for individual I
a   =Constant
$\beta_1...\beta_n$ =Variables
$\alpha_1...\alpha_n$ =Coefficients

Descriptions of the variables are given in Table 1:

Table 1: Variable Specification for the Model 1 and 2

VARIABLE	DESCRIPTION
AGE	Range:20-72
EDU	Education Level: 1=Literate
	5=Primary School
	8=Secondary School
	11=High School
	15=University
WITH_NAT	Working time of the respondent

HOUSEHLD	Household size
TOTALAND	The amount of land of the respondent
ENV_SENS	1= The nature is important for the Turkey
	0=The nature is not important for the Turkey
CHEM_USE	1= I will not use chemicals
	0= I will use chemicals
NEXT_GEN	1=Yes, project is benefical for the next generations
	0=No, project is not benefical for the next generations
PRO_INFO	1=have project information
	0=have not project information
PER_BENF	1=Yes, project is benefical for the person
	0=No, project is not benefical for the person
LAND_OWN	0=inheritance
	1=buying
	2=inheritance+buying
NAT_PROT	1=Yes, it is necessary to protect the nature
	0=No, it is unnecessary to protect the nature
OTHER_SP	1=Other species can be removed for human
	0=Other species can not be removed for human

For the model, a selection criterion is an index that can be computed for each candidate model and used to compare models. Thus, candidate models can be ordered from best to worst (Alp, 1999). This helps to automate the process of choosing the "best" model. Obviously, the selection criterion should be related to the goal of the analysis. R^2, F, MSE(p), C_p and Durbin - Watson significant test are fundamentally used as selection criterias. In this study F, R^2 and Durbin - Watson significant test were used as the selection criteria.

In order to evaluate most significant parameters on mean WTP, first of all standart regression and then, the method of Forward Stepwise Regression was adapted. In the standart regression, variables AGE, WITH_NAT, EDU, INCOME, TOTALAND were included in the Model 1. In the method of Forward Stepwise Regression, indicator variables were used in the second model, and the independent variables were individually added or deleted from the model at each step of the regression until the "best" regression model is obtained. In the method, the importance of a variable is judged by the size of the t/F statistics for dropping the variable from the model (Anonymous 1995). Following Table 2 is about means and standart deviations of the variables. Table 3 is about correlations among variables placed in the final model.

Table 2: Descriptive Statistics for the Analysis

VARIABLE	DESCRIPTION	
Means and Standard Deviations	Mean	Std.Deviation
AGE	45,267	0,315
WITH_NAT	9,367	0,160
EDU	1,300	0,792

INCOME		3251333333	0,760
TOTALAND		9,567	0,280
ENV_SENS		1,900	0,220
HOUSE_HLD		3,767	0,208
CHEM_USE		0,600	0,558
PER_BENF		0,567	0,340
LAND_OWN		0,433	0,350
NAT_PROT		0,967	0,180
OTHER_SP		0,167	0,430

Table 3: The Correlation matrix for the variables

	AGE	EDU	INCOME	TOTA-LAND	ENV-SENS	HOUS-EHLD	CHEM-USE	LAND-OWN	OTHER-SP	WTP
AGE	1,0000	-0,4435	-0,4144	0,0519	0,0332	-0,3054	0,4863	-0,3338	-0,0454	-0,0348
EDU	-0,4435	1,0000	0,1810	0,1238	-0,2131	0,0360	-0,3138	0,5118	0,0607	0,4373
INCOME	-0,4144	0,1810	1,0000	0,1334	0,1797	0,3161	-0,7973	0,2658	0,3365	0,1161
TOTALAND	0,0519	0,1238	0,1334	1,0000	0,0047	0,0588	-0,0118	0,3372	0,1836	-0,2374
ENV_SENS	0,0332	-0,2131	0,1797	0,0047	1,0000	0,1192	-0,2503	-0,4658	0,0514	-0,2129
HOUSEHLD	-0,3054	0,0360	0,3161	0,0588	0,1192	1,0000	-0,2854	-0,0326	0,0108	0,1867
CHEM_USE	0,4863	-0,3138	-0,7973	-0,0118	-0,2503	-0,2854	1,0000	-0,2662	-0,3651	0,0655
LAND_OWN	-0,3338	0,5118	0,2658	0,3372	-0,4658	-0,0326	-0,2662	1,0000	0,1041	-0,0265
OTHER_SP	-0,0454	0,0607	0,3365	0,1836	0,0514	0,0108	-0,3651	0,1041	1,0000	-0,3327
WTP	-0,0348	0,4373	0,1161	-0,2374	-0,2129	0,1867	0,0655	-0,0265	-0,3327	1,0000

4. Conclusions

In the standart regression model, following equation was obtained:

$$WTP = -7120593,246 + 0,313 AGE + 0,098 WITH\_NAT + 0,613 EDU$$
$$+ 0,169 INCOME - 0,37 TOTALAND$$

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                        MODEL 1 SUMMARY

        Dep.Var.                   :  WTP
        No. of Cases               :  129
        Multiple R                 :  0,60080
        R²                         :  0,36096
        adjusted R²                :  0,22783
        Standart error of estimate :  4085260,0801
        Intercept                  :  -7120593,246
        F                          :  2,711377
        df                         :  5,24
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The first model has lower statistical significiance than the second model. In model 1, total WTP is 5.534.737,872 USD. In the second model, as soon as variable number

increase, F and R values had risen. Furthermore, the impact of the indicator variables was examined upon final model.

As can be seen from Table 2, firstly, model 2 contains all of the variables entered introduced. In the following iterations, variables are eliminated one by one until the desired t-value is attained. As iterations went on, the adjusted R^2 value increased. WITH_NAT, PER_BENF, NAT_PROT were removed from the model and final model was obtained such as:

$$WTP = -11904146,52 + 0,792EDU - 0,32OTHER\_SP - 0,35LAND\_OWN$$
$$- 0,22ENV\_SENS + 0,760INCOME + 0,588CHEM\_USE - 0,28TOTALAND$$
$$+ 0,315AGE + 0,208HOUSEHLD$$

MODEL 2 SUMMARY	
Dep.Var.	: WTP
No. of Cases	: 129
Multiple R	: 0,85391238
R^2	: 0,72916635
adjusted R^2	: 0,60729120
Standart error of estimate	: 2913404,64
Intercept	: -11904146,52
F	: 9,828
df	: 9,20

The final equation for the second model is significant at the 0,05 level as indicated by F value of 9,82 and Durbin-Watson test value of 1,4457. Although this value is in the instability ranges which is d_{low} and d_{up}, there is no autocorrelation among error terms.

Generally, in the analysis of WTP results are based upon medians instead of mean. However, it is the mean and not the median WTP, which strictly correct welfare measure in cost-benefit analysis (Brent 1998). In this study, total WTP(mean)= **2.306.474,836 USD**. The value of total WTP(mean) has to be included in the Benefit-Cost ratio.

Especially after the 1980's, firstly in the USA and Avustralia and then in the other developed countries, environmental impacts were included in the Cost-Benefit analysis . There is no doubt that environmental impacts have increased or decreased the social welfare level. In spite of the fact that B/C analysis has been practiced in the public project assessment of Turkey, these assessments have only involved in the employment contribution, exchange creation impacts etc.. Even if the environmental impact assessment reports have been carried out in some entrepreneurships, it has been only a procedure. Social welfare and environmental impacts should be included in the analysis, and decision maker mechanism should considered the environmental impacts.

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