ACKNOWLEDGEMENTS

My first words of thanks go to my supervisor; Prof.Dr. Ethem Gönenç for giving me the opportunity to study under his supervision and encouraging my interest in Benefit Analysis.

The research also would not have been possible without the aid of Dr. Roy Brouwer whom I have collaborated with in conducting the survey and analyzing the questionnaires. I appreciate all the support I received from him.

A big thanks to the Köyceğiz Group, my colleagues who gave me their valuable time and efforts to help in interviewing almost a thousand people. They worked very hard and they did their best. I'm truly grateful to Özlem Ergenler, who also helped me in the preparation of my thesis, İdil Karagöz, Alpaslan Ekdal, İlknur Adalı, Nusret Karakaya and Elçin Hepsağ.

I greatly appreciate the assistance of Prof. Dr. Gulay Kıroglu, Dean of the Science and Literature faculty of Mimar Sinan University, who is at the same time a member of the Statistical Department of the faculty and helped me in the interpretation of the results of the analysis.

I acknowledge the enduring contributions of my husband, Serhat. Without his patience and encouragement, this long journey could not have been completed. Also thanks to my daughter Selin for being a very good girl during the survey step of my research. At the time, she was only 24 weeks old.

All errors, oversights and opinions are, of course, completely my responsibility.

FOREWORD

Sustainable Development means economic growth and environmental improvement without sacrifice of either. The way to sustainable development implies the consistent use of economic tools for the evaluation of projects, programmes and policies which are either designed to protect the environment or likely to have an environmental impact. It's now clear that an economic evaluation of projects, programmes and policies is very important in developing countries to achieve sustainable development. Basically, how should we decide on economic and environmental policies and investments? There are dozens of economic ways to offer guidance on how to evaluate policies and investment projects. Main core of the economic evaluations of projects is the use of the Cost Benefit Analysis.

In this research, a survey was conducted to evaluate the benefits to households from reduced sewage pollution of surface and ground water quality as a result of the construction of wastewater treatment plants in Köyceğiz-Dalyan Area.

The Contingent Valuation Method (CVM) was selected as the most reliable and widely used non-market valuation method in developing countries. The literature on CVM indicates that the valuation function varies with location and environmental problems, so site specific studies such as the one in this thesis need to be performed. This survey is the first contingent valuation study to be applied to analyze the benefit due to water quality in a very sensitive area, i.e. the Köyceğiz-Dalyan Watershed.

For this study, funding was provided by the Istanbul Technical University (ITU) Research Fund.

Aylin TÜMAY **December,2005**

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ABBREVIATIONS

AB	: Avertive Behaviour
APSA	: Authority for the Protection of Special Areas
BCA	: Benefit Cost Analysis
CPDF	: Cumulative Probability Distribution Function
CVM	: Contingent Valuation Method
DALKO	: Association of Trade and Crafts, Agriculture Cooperatives and Fishery Cooperative
DC	: Dichotomous Choice
DE	: Defensive Expenditure
EC	: European Community
HC	: Human Capital
HPM	: Hedonic Pricing (Property)Method
KfW	: Kreditanstalt für Wiederaufbau
MAC	: Mediterranean Action Plan
MVPE	: Market Valuation of Physical Effects
NPV	: Net Present Value
OECD	: Organisation for Economic Co-Operation and Development
OLS	: Ordinary Least Square
PV	: Present Value
RC	: Replacement Cost
SDD	: Senaryo Destekli Değerlendirme
SIS	: State Institute of Statistics
SPAs	: Specially Protected Areas
SPPS	: Statistical Package for the Social Sciences
STATA	: Statistical Software for Professionals
TCM	: Travel Cost Method
US	: United States
WTA	: Willingness to Accept
WTP	: Willingness to Pay
WWTP	: Wastewater Treatment Plant

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LIST OF SYMBOLS

WTPi	: Willingness to pay
i	: Index of households
SEi	: Socioeconomic and demographic characteristics of the household
PSi	: Prices and availability of substitute goods and services
Bi	: Specific bid level
Bi-1	: Lower bid bound
Bi+1	: Higher bid bound
Prob[yi=1]	: Probability that a respondent says “yes” to a specific bid amount
β	: A vector of variable parameters to be estimated
x	: Corresponding vector of explanatory variable
Pi	: Probability of respondents voting no in the bid interval
m	: Maximum bid
E(WTP)	: Estimated WTP
ni	: Number of no votes to bid level Bi
yi	: Number of yes votes to bid level Bi
s	: Standart error
a	: Estimated constant
b	: Estimated slope for the bid level
df	: Degrees of freedom
R^2	: Determination coefficient
p	: Significant level

BENEFIT ANALYSIS APPROACH AS A TOOL FOR SUSTAINABLE MANAGEMENT , A CASE STUDY IN THE KÖYCEĞİZ DALYAN WATERSHED

SUMMARY

The purpose of this research is to create a guide in benefit analysis of investment projects - mainly environmental protection projects in developing countries.

Environmental Economists measure the benefit (total economic value of the change in environmental quality) using a change in an individuals' well-being as a criterion. Environmental impacts are not accounted for in traditional benefit cost analysis (BCA) since there exists no market price for many environmental goods and services. A new concept was developed and as money speaks louder than words, the concept of Willingness to Pay (WTP) has been used to equate non-priced environmental impacts with other market values. WTP is defined as the monetary value of the change in well-being resulting from a rise in environmental quality.

CVM (Contingent Valuation Method), developed by Environmental Economists mainly for use in water quality research, was preferred to measure the WTP Concept in this study.

The contingent valuation method (CVM) is a survey technique that attempts to elicit information about individuals' (or households') preferences for a good or service. Respondents in the survey are asked a question or a series of questions about how much they value a good or service. The technique is termed "contingent" because the good or service is not, in fact, necessarily going to be provided by the enumerator or research analyst: the situation the respondent is asked to value is hypothetical. The CVM can be used to obtain values of private goods, goods with both private and public characteristics (such as various kinds of infrastructure) and "pure" public goods. Often it is used to assess preferences for goods or services for which a conventional market does not exist.

Over the last decade, the contingent valuation method has attracted an increasing amount of attention in the environmental economics profession and in the broader environmental policy community.

A survey was conducted to evaluate the benefits to households from reduced sewage pollution of surface and ground water quality due to wastewater treatment plants in the Köyceğiz-Dalyan Area.

While the survey was being implemented, wastewater treatment facilities were constructed in Köyceğiz and Dalyan. According to the agreement signed between the Municipality and the contractor; after completion of the construction, the contractor would operate the plants for one year and no payment would be charged from the people for this period. The municipality tried to make a payment plan for the addition of the wastewater fee to water bills for the coming years.

Since the Contingent Valuation Method (CVM) is the only practical means of estimating the environmental benefits, this method was applied in the Köyceğiz-Dalyan Area in June 2002.

The questionnaire was designed according to the results of reviewing questionnaire samples in literature and discussions with some environmental economists who were experts in that field.

The single bounded dichotomous choice approach was preferred as the technique of asking contingent valuation question in this study. The advantage of the DC question is that each respondent is asked a single valuation question that is relatively easy to answer. A disadvantage is that larger samples are necessary to implement the DC approach. For each money amount, including in the experimental design, it is necessary to have large samples (n=300 or more) for statistical purposes.

During the survey, the attitude of the households was very positive to the project. Some of them complained that the authorities had not informed them about the project beforehand. The majority of the community agreed that this type of research had to be completed before the realization of such projects.

SPSS was used to analyze the questionnaire results. SPSS is a powerful statistical package for data analysis. The distribution of the WTP was estimated by using the parametric and non parametric approximations. In this study a (parametric) logistic probability model and the (non-parametric) Turnbull model were used to estimate mean WTP.

One of the most powerful ways of checking the reliability of the valuation information is to carry out multivariate analyses of the determinants of the valuation responses. In Multivariate Regression, the datasets of the two towns are pooled into one data set in order to increase the total number of observations in the estimation procedure. Both models are found statistically significant, as a result of the Chi-square statistics.The explanatory power of both models (measured through R-square) is in the range usually found in the literature. The overall predictive power of the models is reasonable, ranging between 78 and 83 percent. This means that the estimated models are able to correctly predict a yes or no answer to the willingness to pay question in approximately 80 percent of the cases included in the analysis.

This study consists of the five parts. The first is an introduction that describes the scope and importance of the study. In the second part, it is reviewed the related literature about the Non Market Valuation techniques. The third part includes the general overview of the study area and analysis of the questionnaire. The fourth, the results of the analysis were summarized and the finally, fifth presents the conclusion and recommendations.

SÜRDÜRÜLEBİLİR YÖNETİM İÇİN BİR ARAÇ OLARAK FAYDA ANALİZİ YAKLAŞIMI, KÖYCEĞİZ DALYAN HAVZASINDA YAPILAN BİR ÇALIŞMA

ÖZET

Bu çalışmanın gelişmekte olan ülkelerde yatırım programlarında yer alan başlıca çevre koruma projelerinin fayda maliyet analizlerinin yapılmasında büyük önem taşıyan fayda analizlerinin yapılmasına bir rehber olması amaçlanmıştır.

Çevresel mal ve hizmetlerin ekonomik fayda analizleri giderek daha çok ilgi toplamaktadır. Ekonomik değer tayinine olan bu ilgi, çevrenin korunması ve iyileştirilmesi için harcanan çabaların maliyetli olmasından kaynaklanan kaygı sonunda doğmuştur. Çevre Ekonomistleri, faydayı (çevre kalitesindeki değişimin toplam ekonomik değeri) kişilerin refah düzeylerindeki değişimi ölçerek belirlemektedirler. Amaç, çevre kalitesinde oluşan herhangi bir değişiklik sonucu yaşam kalitesinin iyi ya da kötü yönde ne oranda değiştiğinin belirlenmesidir. Çevresel hizmet ve mallar için bir piyasa değeri olmadığı için klasik fayda maliyet analizleriyle çevresel etkiyi hesaplamak mümkün değildir. Yeni bir kavram geliştirilmiştir. Diğer market değerlerine eşit olarak fiyatlandırılamayan çevresel etkileri parasal olarak ifade etmek için geliştirilen bu kavram, WTP (Willingness to Pay; Ödeme İsteği)' dir. WTP, çevre kalitesindeki artışın sonunda kişinin refahında (veya mutluluğunda) meydana gelen değişimin parasal karşılığıdır.

Bu çalışmada WTP'yi ölçmek için Çevre Ekonomistleri tarafından geliştirilen ve özellikle su kalitesi ile ilgili çalışmalarda yaygın olarak kullanılan CV (Contingent Valuation) (Senaryo Destekli Değerlendirme) Metodu tercih edilmiştir.

SDD (Senaryo Destekli Değerlendirme) Metodu bireylerin mal ve hizmetler için tercihleri hakkında bilgi toplamak amacıyla yapılan bir araştırma tekniğidir. Çevresel mal ve hizmetleri oluşturan değer bütününde kullanılmayan değerlerin fayda tayininde kullanılan tek yöntemdir. Araştırma sırasında bireylerin bir hizmet veya mal için biçtikleri değeri öğrenmeye çalışan soru yada sorular serisi kullanılmaktadır.

SDD Metodu özel malların, hem özel hem de kamu mallarının (altyapı gibi) yada yalnız kamu mallarının fayda tayininde kullanılabilmektedir. Bu yöntemle genelde standart bir piyasası olmayan mal ve hizmetler için yapılan tercihler değerlendirilmektedir.

SDD Metodunun uygulandığı Köyceğiz Dalyan Bölgesi, Türkiye'nin güney batısında Muğla ili sınırları içinde yer almaktadır. Dalyan belde belediyesi iken Köyceğiz il belediye sınırları içinde kalmaktadır. Bölge, 12.06.1988 tarihinde "Köyceğiz-Dalyan Özel Çevre Koruma Bölgesi" olarak ilan edilmiş, 18.01.1990 tarihli Bakanlar Kurulu Kararı ile bölge sınırları genişletilmiştir.

Yaklaşık olarak 7500 kişilik (2000 yılı) nüfusa sahip olan Köyceğiz'de tarıma dayalı bir yaşam tarzı gözlenmektedir. Dalyan'da ise toprağa bağımlılık, özellikle pamukçuluğa dayalı geleneksel yaşam tarzı değişmiş ve yaklaşık 4850 kişilik (2000 yılı) bir nüfusa sahip olan Dalyan, varolan kaynaklarını hem bireysel hem de bölgesel düzeyde turizm sektörüne yatırım faktörü olarak kullanmaya yönelmiştir.

Köyceğiz ve Dalyan'da ayrı ayrı yapılmakta olan atıksu arıtma tesislerinin tamamlanmasıyla birlikte septik tanklardan kaynaklanan ve yüzey (göl) ve yeraltı suyunun kirlenmesine sebep olan problem ortadan kalkacaktır. Zaman içersinde tamamen ortadan kalkacak olan kirliliğin arıtma tesislerinin çalıştırılmasıyla ortadan kalkmasının yarattığı faydanın orada yaşayan halk için kaç para ifade ettiğini ölçmek için bir çalışma yapılmıştır.

Çalışma yapılırken, her iki yerleşim biriminde de Arıtma Tesislerinin yapımı devam etmekteydi. Belediye ve Tesisleri inşaa eden Müteahhit arasında imzalanan sözleşmeye göre müteahhit, tesisleri 1 yıl süreyle işletmekle mükelleftir. Bu sure içinde halktan bir bedel tahsil edilmeyecektir. Bu çalışma yapılırken, Belediye ile yapılan görüşmelerde onların da gelecek yıllarda halktan tahsil etmeyi planladıkları aylık su bedellerini hesaplamakta oldukları görülmüştür.
Çevresel faydanın tahmin edilmesinde Köyceğiz Dalyan yerleşim birimlerinde Haziran 2002 tarihinde en pratik metod olan Contingent Valuation Method (CVM) (Senaryo Destekli Değerlendirme Metodu) uygulanmıştır.

Uzman çevre ekonomistlerinin danışmanlığında ve literatürdeki anket çalışmalarının incelenmesi sonucu, Köyçeğiz Dalyan kasabalarına uygulanacak olan anketin soruları tespit edilmiştir.

Bu çalışmada , SDD soru tipi olarak Single bounded dichotomous choice seçilmiştir. Bu yöntemin avantajı, ankete katılan her bir kişiye cevap vermesi kolay tek bir değerlendirme sorusu sorulmaktadır. Dezavantajı ise bu yöntemin değerlendirilebilmesi için ankete yüksek sayıda katılımın gerekliliğidir (300 ve daha fazla). Bu çalışmada her iki kasaba için ayrı ayrı 400 kişiyle görüşülmüştür. Toplamda 800 anket tamamlanmıştır.

Araştırma süresince, her iki halkın projeye bakışlarının pozitif olduğu gözlemlenmiştir. Bazıları idarelerin onları proje başlamadan önce bilgilendirmediği hususunda yakınmışlardır.

SDD analizine geçmeden önce anket sonuçlarının değerlendirilebilmesi için bir istatistik program olan SPSS (Statistical Package for the Social Sciences) seçilmiştir. SPSS, data analizinde kullanılan etkili bir istatiksel paket programdır. Bu çalışmada , ortalama Ödeme İsteğini WTP (Willingness to pay) tahmin etmek için parametrik ve parametrik olmayan iki ayrı model kullanılmış ve sonuçları da detaylı olarak , 4. bölümde anlatılmıştır.

Yapılan bu çalışmanın güvenilirliğini test etmek için çok değişkenli analizler kullanılmaktadır. Çok değişkenli regresyon çalışması yapılmıştır. Her iki kasabaya ait veriler , tek bir havuzda toplanmış ve böylece gözlem sayısı arttırılmıştır. İki farklı model denenmiş ve her iki modelin de sonuçları istatistiksel olarak ki-kare testinin sonucu olarak, anlamlı bulunmuştur. Her iki modelin açıklama gücü (R2 olarak ölçülmektedir) , literatürde bulunan aralık da çıkmıştır. Modellerin tahmin etme gücü, oldukça yüksek bir oranda çıkmıştır. Yüzde 78 ve yüzde 83 olarak bulunmuştur. Bunun anlamı, her iki model, WTP sorusuna bu analizde evet mi yoksa hayır mı cevabının verileceğini yüzde 80 doğru olarak tahmin edebilmektedir.

Bu çalışma , beş kısımdan oluşmaktadır. İlk bölümde , tanıtım kısmı yer almaktadır. Tanıtım bölümünde çalışmanın kapsamı ve önemi vurgulanmıştır. İkinci bölümde piyasası olmayan değerlendirme teknikleri hakkında ilgili literatür çalışması yer almaktadır. Üçüncü bölümde, SDD Metodunun uygulaması ele alınmış ve çalışma alanı olan Köyçeğiz Dalyan bölgesinin sosyo ekonomik yapısı incelenmiştir. Ayrıca anket çalışmasının hazırlık devresi detaylarıyla açıklanmıştır. Dördüncü bölümde ise analizlerin sonuçları verilmiş ve sonuçlarla ilgili değerlendirmeler yapılmıştır. Son bölüm, beşinci bölümde ise çalışmanın sonuçları ve daha sonraki çalışmalar için yapılan öneriler yer almaktadır.

1.INTRODUCTION

1.1 Aim and Scope

The aim of this research is to create a guide in benefit analysis of investment projects - mainly environmental protection projects in developing countries.

Environmental economists measure the benefit (total economic value of the change in environmental quality) using a change in an individuals' well being as a criterion. Environmental impacts are not accounted for in traditional cost-benefit analysis (CBA) since there exists no market price for many environmental goods and services. A new concept was developed and as money speaks louder than words, the concept of Willingness to Pay (WTP) has been used to equate non-priced environmental impacts with other market values. WTP is defined as the monetary value of the change in well-being resulting from the increase in environmental quality.

A survey was conducted to quantify the benefits (WTP) to households from reduced sewage pollution of surface and groundwater quality due to the wastewater treatment plants in Köyceğiz-Dalyan Area.

Since the Contingent Valuation Method (CVM) is the only practical means of estimating the environmental benefits, this method was applied in Koycegiz and Dalyan towns in June 2002.

CVM is a method that attempts to elicit information about individuals' preferences for a good or service. Mostly, if policy makers want to know people's existence values for a natural area, the CVM is the only available benefit estimation procedure (Pearce et al., 1994).

The questionnaire was designed after a comprehensive research of the relevant literature and practical applications. 400 households from each town participated in the survey. A group of seven environmental specialists completed the survey in 15 days in about 850 man-hours. The results of the questionnaire were analyzed using the SPSS program which is a powerful statistical package for data analysis.

1.2 Meaning and Significance

There is currently much interest in measuring the benefits of environmental quality improvements for policy purposes in developing countries.

As a methodology, CV provides a useful framework to help the government understand how much the public is willing to pay for environmental improvements. In the case of Köyceğiz-Dalyan, if the Turkish Government had a reasonable estimate of the value of a water quality program for the public, it could have made a better assessment in investing in a wastewater treatment system.

The majority of applications of all of the Valuation Techniques have been carried out in the US and Canada, followed by Europe. Not surprisingly, few applications have been realized in developing countries. However, interest in valuation work in developing countries is growing rapidly. This research aimed to set an example for the application of the CV Method in Turkey as a developing country. In line with this purpose, a step by step explanation was given about how this method was applied and analyzed.

In practise, The World Bank has used CVM to determine site selection, optimal level of service and tariff design for the community's water projects. CV studies in developing countries are becoming important, given that the available data on the benefits of diffferent kinds of projects are quite limited. Not only do the relatively low costs of such methods in developing countries, allow researchers to conduct elaborate experimental designs and use larger sample sizes, but bilateral donor agencies and international development banks are increasingly putting contingent valuation techniques to use in project and policy appraisal as part of their everyday operations.

Furthermore , in Turkey as in many development economies, the measure of the potential economic benefits of water and wastewater services can serve as a guide for development assistance for those low income or subsistence communities that do not generate enough money to implement such a project themselves. The estimated economic benefits using the CVM methodology can be great value as a way of improving the allocation of development assistance.

2. AN OVERVIEW OF THE NON-MARKET VALUATION TECHNIQUES

2.1 Non Market Values

The resource and environmental economic literature commonly refers to two categories of economic value: market and non-market value (Bateman and Willies,1999). Market values are derived from the purchase of market goods and are demonstrated through market prices. Non market values reflect benefits people receive from goods and services which are not provided via a well-functioning market. Examples of such goods include recreation at a public beach and national parks.

Non - market values can be further broken down into use and non-use values, as depicted in Figure 2.1. Use values are enjoyed by individuals who benefit from some form of direct interaction with the good. For example, recreational users of a river receive benefits from being able to use the water for fishing,swimming and boating.

Research results have demonstrated that when questioned as to how much they would be willing to pay to access familiar non-market environmental amenities with which they have direct interaction; respondents typically have little difficulty expressing their willing to pay to access these amenities (Hanemann,1994). Assuming that people's willingness to pay is not more than the benefits that they expect to gain, willingness to pay estimates can be considered to estimate of the value of benefits received.

Conversely, non use values accrue to people who may have no direct interaction with the good. The application of non use values in economic decision making is a more recent development and is more complicated.

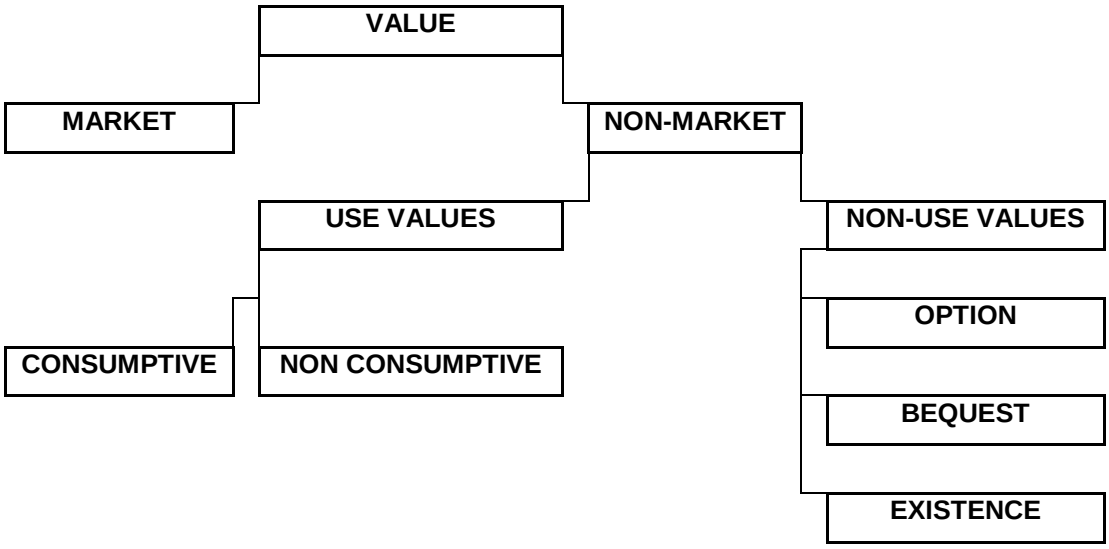

Figure 2.1.The Exposition of Non-use Values (Sarker and Mc Kenney,1992)

Non use values fall into three broad categories:Option values, bequest values and existence values. Option values are benefits that people derive from knowing that they retain the option to use the amenity in the future. The idea originated with Weisbrod (1964), who suggested that option values might exist for non market users of parks and other environmental amenities. He observed that actual visits might understate the value of giant redwoods in Sequoia National Park because people who anticipate visiting the park at some time in the future but who in fact, may never visit it, nonetheless would be willing to pay for an option that guarantees the possibility.

Bequest values are benefits derived specifically from knowing that an amenity is preserved to benefit future generations. This value is based on the utility that accrue to individuals of the current generation from their knowledge that they have provided greater well being for individuals of future generations. A bequest can take the form of a stock of human, physical and natural capital (Pearce et al.1989).

Lastly, existence values reflect that aspect of non use value that relates to the satisfaction a person gains from the knowledge that an environmental amenity will continue to exist indefinitely in its current state. A person is said to hold existence values if she or he derives benefits simply from the knowledge that the amentiy will continue to exist in a given state even though she or he may never go to the site nor use it for any purpose (Boardman et al.1996).

In this part of the study, the principal techniques for assigning economic values of non-market goods and services will be discussed . There is a great interest in attempts to put monetary values on environmental goods and services. The interest in valuation techniques arises in part from concern that efforts to protect and improve the environment be cost effective.

2.2 Types of Valuation Techniques

The meaning of the valuation is to determine how much better or worse off individuals would be as a result of a change in environmental quality.

Valuation of environmental and health impacts using these nonmarket valuation methods has evolved from being mainly a U.S activity in the 1960s and 1970s to become an important field also in Europe in the 1980s and 1990s (Navrud, 1997).

At the same time, nonmarket valuation methods are applied at an increasing rate in developing countries in Asia, Latin America and Africa.

Economists define the value of a change in terms of how much of something else an individual is willing to give up to get this change (or how much they would accept in order to permit the change to occur). There are three main kinds of Valuation techniques ;

- The use of stated preferences (what people say their environmental values are)

- Various kinds of revealed preferences (inferences drawn from peoples' actual behaviour)

- Using market prices for the physical effects of environmental change on production

First approach is simply to ask people how much they would be willing to give up (i.e., how much they would be willing to pay) to have a specified environmental quality improvement happen. This is known as the "stated preferences" or "contingent valuation method" .It is also termed the direct approach because people are directly asked to state or reveal their preferences. The Contingent Valuation Method (CVM) may apply equally to changes in public goods such as air quality,landscape or the existence values of wildlife, as to goods and services sold to individuals, such as improved water supply and sewerage. It may apply both to use values (e.g. water quality,viewing wild animals,direct enjoyment of a view) or non use values(existence values) (Winpenny,2003).

In the second approach, economists try to find a good or service that is sold in markets. This is known as the ”revealed preferences”. In this situation, the individual may reveal his or her preferences for both the market and non-market service when he or she purchases the market good. For example, when making a decision on what house to buy or apartment to rent, an individual may consider many factors, such as size and age of the house, its proximity to schools,shopping and place of employment and perhaps the air quality in the neighbourhood (Pearce et al,1994). There are three principal techniques. The travel cost method (TCM) uses the time and cost incurred in visiting and enjoying a natural site as a proxy measure of the price of entering it. Avertive behaviour (AB) obtains information from what people are observed to spend to protect themselves against an actual or potential decline in their environmental quality. The hedonic pricing method (HPM) starts from the fact that the price of a property reflects, amongst other things, the quality of the environment in which it is located. Applied to property, it uses econometric analysis of large data bases to unbundle environmental attributes from the various other factors making up the price of a dwelling or piece of land.

In the third approach, economists use market prices for the physical effects of environmental change on production.This method values environmental change by observing physical changes in the environment and estimating what difference they will make to the value of goods and services. Within the MVPE (Market Valuation of physical effects) category, several techniques are available. Dose-response measures estimate the physical impact of an environmental change on a receptor, such as air pollution on materials corrosion, acid rain on crop yield , or water pollution on the health of swimmers. Damage functions use dose-response data to estimate the economic cost of environmental change. The physical impact caused by environmental change is converted to economic values using the market prices of the units of output.

Under the production function approach, environmental “inputs” such as soil fertility and air and water quality can be related through econometric techniques to output, showing how output varies with changes in the various kinds of input. The human capital method estimates the cost of bad health resulting from environmental change according to its effect on the productivity of the worker.

The replacement cost method estimates the cost of environmental damage by using the costs which the injured parties incur in putting the harm right, either by

observing what the victims actually spend or by consulting expert opinion on what it would cost to remedy the problem.

For each of the four broad kinds of impact (Productivity, Health, Amenity and Existence values) identified above, different valuation methods are appropriate. The options are set out in Table 2.1.

Table 2.1. Environmental Impacts and Valuation Methods

Impact	**Valuation Methods**
Productivity	Market valuation of physical effects(MVPE) Avertive behaviour (AB) Defensive expenditure (DE) Replacement cost (RC)
Health	Human capital (HC) Contingent Valuation (CVM) Avertive behaviour (AB) Defensive expenditure (DE)
Amenity	Contingent Valuation (CVM) Travel cost(TCM) Hedonic property method(HPM)
Existence values	Contingent Valuation (CVM)

2.2.1 Revealed Preferences: Surrogate(Proxy) Markets

Surrogate Market techniques are an indirect approach to monetary valuation of environmental benefits, which aim measure individuals preferences for better levels of environmental quality, usually by looking at observed market behaviour and choices. Surrogate markets look at markets for some other good or service related to the environmental benefits and costs of concern. The goods or factors of production bought and sold in these surrogate markets will often have as complements the environmental benefits and these will influence the decision to buy or sell. As an example neighbourhood air quality is an attribute of houses, which are bought and sold in markets and so a surrogate market for air quality is housing. The techniques of the Surrogate Markets are the Travel Cost method, Hedonic Pricing, and Avertive behaviour (AB) . These techniques are best suited to valuing sites and services and for urban pollution problems. They have the advantage that they are based on real rather than the hypothetical choices as the Revealed Preference

techniques. Values found are therefore more likely to be acceptable to policy and decision makers.

All the techniques can only be used when people are aware of environmental effects, and they often require large amounts of data and statistical sophistication , as well as imposing restrictive assumptions to the extent that their use in developing countries may be limited. Benefit valuations obtained from these techiniques are the estimates, their accuracy depending to a large extent on the quality of the data used. Furthermore, the techniques can only measure use values, with the other constituent parts of total economic value being ignored.

All three methods estimate people's revealed preferences from data on their observed market behaviour. In this respect, they differ from the technique which draws information from peoples' stated preferences.

2.2.1.1. The Travel Cost Method

The Travel Cost method has been widely used to measure the demand and benefits of recreation site facilities and characteristics as well as for the general valuation of time, for example in the benefits of improved fuelwood supply or water collection in developing countries.

The basic idea behind the technique is that information on money and time spent by people in getting to a site is used to estimate willingness to pay for a site's facilities or characteristics. The problem here is that some recreation sites charge a zero or negligible price which means that it is not possible to estimate demand in the usual way. However , by looking at how different people respond to differences in money travel cost we can infer how they respond to changes in entry price, since one acts as a surrogate price for the other and variation in these prices results in variation in consumption.

The Travel Cost demand function is interpreted as derived demand for a site's services and depends on the ability of a site to provide the recreation activity. Since the recreation acvitiy takes place at specific sites that have observable characteristics and measurable travel cost the recreational activity service flows are described as site specific. The approach can therefore provide us with estimates of the itself and, by observing how visitation rates to a site change as the envionmental quality of the site changes, provide us with values for environmental quaility itself. The estimation of demand and the derivation of these values requires observation on the variation in prices, consumption and the quality characteristics of the site.

When is TCM appropriate?

TCM is potentially useful in the following situations or sectors:

- Recreational sites
- Nature reserves, national parks, forests and wetlands used for recreation
- Dams,reservoirs,forests etc with recreational by products
- Fuelwood supply
- Collection of drinking water

It is appropriate where:

-The site is accessible, for at least part of the time

-There is no direct charge or entry fee for the good or service in question, or where such charges are very low

- People expend significant time or other costs to travel to the site

Application of Travel Cost to Developing Countries

Applications are numerous in developed countries where motor cars enable easy access to sites, and an where time has significant oppportunity costs. This will not often be case for developing countries. Recreation areas will often be close to urban areas (due to limited transportation and low incomes) and so travel costs will be very small. Valuation of non - work time is also more crucial since there will be more people who are non-producers than in developed countries. Also, visitors will often use a recreation area to seek a break from work. Access to sites may be subject to constraints and so observed travel costs may not accurately reflect actual willingness to pay.

However, with the growth in tourism the approach may still have an important role to pay in valuing recreation areas such as national parks as well as its established contribution to valuing commodities such as fuelwood and water.

In conclusion, it can be said that the Travel Cost Approach important method of evaluating the demand for recreational facilities. The techniques used have improved considerably since the earliest studies were carried out both from an empirical and theoretical point of view. There are reservations as to its use, particulary concerning the large amounts of data required which are expensive to collect and process. Furthermore difficulties remain with the estimation and data analysis techniques and so the method is likely to work best when applied to the valuation of a single site, its characteristics and those of other sites remaining constant.

2.2.1.2. Hedonic Pricing

The Hedonic Pricing method has been used extensively in developed countries to place values on environmental benefits and costs relevant to air and noise pollution. The approach looks at finding a market in some good or service for which the environmental good or service of concern is an attribute, in order to infer individuals' preferences for environmental quality. An example of this is the property market, in which one of the attributes of housing which influences an individual's decision to buy or sell may be the level of environmental quality, such as air pollution in the surrounding neighbourhood.

Given that different locations of property will have different levels of environmental attributes and that these attributes affect the stream of benefits from the property, then the variation in attributes will result in property values (since property values are related to the stream of benefits). The hedonic pricing approach looks for any systematic differences in property values between location and tries to separate out the effect of environmental quality on these values. Since there are many factors which influence property values, these must all be separated out using statistical techniques such as multiple regression so that it can be identified how much of a property differential is due to any difference between environmental attributes at the properties. The hedonic approach then goes on to infer how much individuals are willing to pay for an improvement in environmental quality, i.e., estimate the demand for it.

When is HP appropriate?

HP could be useful in the following cases:

-Local air and water quality changes

-Noise nuisance,especially from aircraft and road traffic

-The impact of amenity on community welfare

-Choosing the location of environmentally hazardous facilities (sewage works, power stations,etc.) planning railway or highway routes

-Evaluating the impact of neighbourhood improvement schemes in poorer parts of cities

HP is most appropriate where:

-property markets are active

-environmental quality is perceived by the population as a relevant factor in property values

-Local variations in environmental quality or changes over time, are clearly perceptible

Property markets are relatively undistorted and transactions are transparent.

Application of HP to Developing Countries

Developing countries are less likely to have freely functioning and efficient property markets, and housing mobility and choices will be more constrained by income, institutional,cultural and ethnic factors. Use of the technique should be made with great care, therefore, even without considering the fact that there will be less information and data available.

Although markets may exist in developing countries, prices are not likely to be market clearing due to the imposition of rent controls and state intervention. Housing shortages will mean there is also little choice of residence. However, simple versions of the technique may be useful in establishing the effects on property values of improvements in neighbourhood amenities such a water supply, rubbish collection, street lighting, ect. Providing there is data on property values before and after the changes and so give rough estimates of benefits.

In conclusion it can be said that the Hedonic Price Technique has been widely and effectively used to estimate the impacts of environmental factors, particularly air and noise pollution, on property values. The approach does not measure non-use values and is confined to cases where property owners are aware of environmental factors and act because of them. Applications to developing countries have been few due to problems of data availability and the nature of markets in these countries. The technique is not very suitable where markets are not functioning efficiently, and will work poorly if the environmental effects are unclear to the affected individuals and cannot be suitably measured. Despite the many problems of the approach, the model when applied carefully and in the right situation is capable of a level of accuracy consistent with the results of other approaches.

2.2.1.3. Avertive Behaviour

Faced with the prospect of a change in their environment, people attempt to compensate in various ways. If their environment is deteorating , or is likely to people will try to protect themselves against expected hardship. They will buy goods and services which help to preserve their environments. These goods may be

regarded as substitutes or proxies for environmental quality. In the reverse case, where environmental quality improves, spending on these substitutes will decline.

There are various kinds of avertive behaviour (AB):

-Defensive Expenditure (DE), sometimes called preventive spending where people try to protect themselves against a decline in their habitat, e.g. by anti-soil erosion measures installing water filters and purifiers, or putting air conditioners in their cars

-The purchase of environmental surrogates is closely related to this, e.g. purchase of water from tankers or in bottles in preference to contaminated or unreliable public supplies

-People who feel particularly strongly about an environmental change may opt to relocate themselves

For reasons to be detailed below, AB is an imperfect measures of peoples' environmental preferences. However, it has the virtue of using the evidence of peoples' actions rather than their words and the method is straightforward and easy to apply, compared to other valuation techniques.

AB is potentially relevant to:

-air,water or noise pollution

-erosion,landslide or flood risk

-soil fertility, land degradation

-marine and coastal pollution and erosion etc.

It is appropriate where:

-people understand the environmental threats to which they are exposed

-they take action to protect themselves

-these actions can be costed

2.2.2.Stated Preferences : Contingent Valuation (CV) Method

Although Ciriacy (1947) made the first reference to a valuing public goods using a technique that would ask people directly , it was David (1963) who designed and implemented the first CV study to estimate the value of outdoor recreation in the Maine Woods (McComb,2000).

CV Method has formed the basis for a significant amount of policymaking in the United States. Recently, the World Bank, the United States Agency for International

Development and other donor agencies have taken an interest in contingent valuation as a means of assessing the demand for sanitation services,improvements in the water supply, the benefits of establishing national parks and costs/benefits of restricting land use to reduce tropical deforestation in developing countries.

Based on the results of contingent valuation studies, researchers have been able to predict the number of connections to water supply systems at improved conditions, and the resulting revenue for the local water authority, making it possible to study the feasibility of such improvements and of various financing schemes. Recent work by the World Bank shows that contingent valuation correctly predicted 91 percent of the actual connections to the piped water system(Cropper and Alberini,1998)

The contingent valuation method (CVM) is a survey technique that attempts to elicit information about individuals (or households) preferences for a good or service. It is the only technique that measures the nonuse values. Respondents in the survey are asked a question or a series of questions about how much they value a good or service. The technique is termed “contingent” because the good or service is not, in fact, necessarily going to be provided by the enumerator or research analyst: the situation the respondent is asked to value is hypothetical. The CVM can be used to obtain values of private goods, goods with both private and public characteristics (such as various kinds of infrastructure) and “pure” public goods. Often it is used to assess preferences for goods or services for which a conventional market does not exist.

Over the last decade, the contingent valuation method has attracted an increasing amount of attention in the environmental economics profession and in the broader environmental policy community. There are several reasons for this widespread interest in the contingent valuation method- some good and some not.

First, CVM is the only practical means of estimating some kinds of environmental benefits. For example, if policy makers want to know people’s existence values for a unique natural habitat or wilderness area, the contingent valuation method is the only available benefit estimation procedure. Many analysts have applied the CV Method to water related issues (Young,1996).

Second, the evidence available from the United States and Europe suggests that estimates of environmental benefits obtained from well-designed contingent valuation surveys appear to be as good as estimates obtained with other valuation methods (Cumings,et. al. (1986); Mitchell and Carson, (1989); Arrow et. al.(1993)).

On the negative side, some naive analysts are attracted to the contingent valuation method because it appears on the surface to be so easy to do: just ask people a few questions and tabulate their answers. Over the last few decades ,survey researches involved with public opinion polling have learned a great deal about the “art of asking questions” and their conclusions should give newcomers to the contingent valuation method reason for caution (Schuman and Presser,1981).

CV is potentially useful for the following types of problem or sector:
-Air and water quality

-Recreation(including fishing,hunting,parks,wildlife)

-Conservation of unpriced natural assests such as forests and wilderness areas

-Option and existence values of biodiversity

-Risks to life and health

-Transport improvements

-Water,sanitation and sewerage

CV is appropriate where:
-environmental changes have no direct impact on marketed output
-it is not feasible to observe peoples’ preferences directly
-The population in the sample is representative, interested in and well informed of the subject in question
-There are adequate funds, human resources and time to do a proper study

2.2.3. Market Valuation of Physical Effects

The most straightforward way of valuing environmental change is too observe physical changes in the environment and estimate what difference they will make to the value of goods and services. In these cases, environmental changes cost someone money.
Various methods are used in MVPE:
Dose response measures estimate the physical impact of an environmental change on a receptor such as air pollution on materials corrosion, acid rain on crop yield or water pollution on the health of swimmers

Damage functions use dose-response data to estimate the economic cost of environmental change. The physical impact caused by environmental change is converted to economic values using the market prices of the units of output.

The production function approach. A common economic technique is to relate output to different levels of inputs of the so-called factors of production (land, labour, capital, raw materials). A change in the use of one of these (say, labour) will produce a certain change in output. Production is said to be a function of these inputs and is related to them algebraically. Environmental “inputs” such as soil fertility and air and water quality can be included as inputs where they can be measured and where they have a clear effect on output (e.g. the saline content of irrigation water is one of the influences on crop yield along with the quantity of water, amount of seed, fertilizer, labour,etc.)

The human capital method estimates the cost of bad health resulting from environmental change. Evidence is sought from epidemiological data, control group experiments or other observations about the likely effect of environmental quality on human health.

Replacement cost is a special case of the same approach. In this case, the damage cost of environmental change is estimated by the costs which the injured parties incur in putting the harm right.

MVPE is sometimes called a “short cut” method because it proceeds straight to estimating the impact of environmental change on the receptor concerned. This method is not concerned with what people say they prefer or inferring environmental values indirectly from what they are observed to do.

The approach has widespread application. It can be applied to the following kinds of problems and issues:

-The effect of soil erosion on crop yield and the impact of resulting downstream siltation on other users of the watershed.(e.g. lowland farmers, irrigators, water utilities)

-The effect of acid rain on the growth,stunting and blemishing of crops and trees and its effect on the corrosion and tarnishing of materials and equipment

-Damage from air pollution to human health, due to the presence of air-borne particulates or other harmful substances

-The impact of water pollution on human health

-Salisation of irrigated land use to poor drainage and water-logging, affecting crop yields

-The climatic and ecological effects of afforestation

2.2.4.Selection of the appropriate Valuation Technique

All of the valuation techniques described in the above have strengths and weaknesses, and the decision on which valuation technique to use for a particular application requires experience and judgement on the part of the analyst.

It is also possible to use more than one valuation technique and compare the results. If the analyst has multiple estimates, she or he will have greater confidence in the magnitude of the value of the proposed change. Several of the valuation techniques typically use data from a household survey (e.g. contingent valuation, travel cost model and hedonic property model).

Different valuation techniques may measure different things. In this sense, they should be considered complimentary, not competing tools. For example, the contingent valuation method is the only available technique for measuring nonuse (or passive use) values. Suppose that estimates of use value of a national park and wildlife reserve were obtained using a travel cost model and estimates of nonuse value were obtained from a contingent valuation survey. These value estimates are not substitutes for one another ; both are useful for policy makers.

In order to provide the necessary depth, one particular and widely used method for valuing the non-market benefits of environmental and development projects-contingent valuation was chosen. Another reason to selection of this method, one of the initial applications of this method in developing countries were precisely in water supply and sanitation (Whittington,1990; McPhail,1994)

2.2.5. Implimentation Methodology of CV Method

2.2.5.1 Types of interviews used in contingent valuation surveys

First step for CV Method, decision of the interview type .The interviews for a CV Study can be conducted by mail, telephone or in-person- or some combination of these. Each type of interview can be appropriate under certain conditions. In person interviews are generally considered to provide the highest quality data if the resources are available to properly train and supervise the enumerators (Arrow et al,1993). The major disadvantages of in-person interviews are their expense and the possible biases introduced by different enumerators asking the same question in different ways. In developing countries, in-person interviews are typically the only option because a substantial portion of the population may not have a telephone or may not be able to read (or return) a mail questionnaire.

2.2.5.2 Components of a contingent valuation questionnaire

Whatever type of interview is selected, most CV survey instruments have three basic parts.

First, a hypothetical description of the terms under which the good or service is to be offered is presented to the respondent. This description seeks to present sufficient information for the respondent to consider carefully the value of the proposed good or service. In mail or in-person interviews pictures or diagrams are often used to be valued should include information on such things as:
-when the service will be available
-how the respondent will be expected to pay for it
-how much others will be expected to pay
-what instutions will be responsible for delivery of the service and
-the quality and reliability of the service

Second, the respondent is asked one or more questions that try to determine how much he or she would value a good or service if actually confronted with the opportunity to obtain it under the specified terms or conditions. In a contingent valuation study, such questions may take the form of asking how much an individual is willing to pay for the service, or how much he is willing to accept in compensation to forgo a loss. Respondents are sometimes asked how they would change their behaviour in response to a hypothetical change in a good or service. Their responses are then used in econometric models to infer their willingness to pay for the described change.

Third, CV Survey instruments usually include a series of questions about the socioeconomic and demographic characteristics of the respondent and his or her family. These data are obtained in order to relate the answers respondents give to the valuation questions to the other characteristics of the respondent. Information may also be collected on respondents' knowledge, attitudes and practices regarding goods or services similar or related to what is being offered in the hypothetical market scenario. The actual sequence of these parts in the questionnaire depends on the particular cultural and social environment.

2.2.5.3. Elicitation Procedures

The parts of the survey instrument that are unique to the contingent valuation method are the description of the hypothetical market and the valuation questions. There are several ways that a respondent can indicate his or her choice or preferences. One is simply to answer a question as to whether or not he would want

to purchase the service if it cost a specified amount. We refer to this as a YES/NO question. Another possibility is to ask the respondent a direct question about the most he or she would be willing to pay for the good or service; we refer to this as a direct or open-ended question.

In addition to this, respondents may be shown a list of possible answers in the form of a “payment” card, and asked to indicate their selection from the list. This approach cannot easily be used in telephone interviews or in countries with high illiteracy rates. It also requires a careful determination of the range of possible answers to be presented on the payment card. Another approach called contingent ranking is to ask the respondents to rank different projects or policies in terms of their desirability or priority.

2.2.5.4. Types of errors and biases in contingent valuation studies

There are three basic categories of errors (or source of problems) involved in contingent valuation studies.

First, at the level of the individual, there are a variety of reasons why a respondent may not reveal his or her “true” value of the good or service.

Second, an individual may offer an accurate answer to a question he or she thought they heard, but this is not in fact the question the enumerator thought he or she asked.

Third, even if each individual were to reveal his or her “true” preferences, problems can arise when analyst attempt to aggregate individual valuation responses to the level of a group or community.

i) Individuals answer CV questions inaccurately

There are some doubts about the validity and reliability of respondents’ answers to hypothetical WTP questions. Two main kinds of concerns are at issue. The first is whether respondents will answer WTP questions honestly and accurately. The second is whether WTP Responses are reliable measures of value.

In this context ,reliability can be viewed either as the variance of a sample of WTP responses around the “true” mean WTP, or as the probability that a respondent’s answer to a WTP question would be the same if he or she could be repeatedly tested (or asked the WTP question many times.). If the reliability of WTP responses is poor, answers to WTP questions may be of little value, even though respondents did not intentionally give inaccurate answers.

Economists have long worried that if individuals actually had to pay their reported WTP values then they would be tempted to understate their true preferences for public goods in hopes of a “free ride” while others pay for the provision of the good or service(Samuelson,1954). Alternatively, if the price to be charged for the public good is not tied to an individual’s WTP response but the provision of the public good is , the respondent may over-report WTP in order to ensure the provision of the good. In both cases, the bid would be systematically different from the respondent’s “true” willingness to pay. Literature on the contingent valuation method has termed this difference “strategic bias”.

Systematic (that is, nonrandom) differences between respondents’ answers to WTP questions and their true willingness to pay can arise for other reasons. Respondents in a particular cultural context may feel it inappropriate to answer some kinds of questions in specific ways or may attempt to give answers that they will please the enumerator. This “compliance bias” can result in substantial differences between reported and true WTP values.

The reliability of respondents’ answers to WTP questions may be weakened in a number of ways. A respondent who does not know his willingness to pay and does not wish to exert the mental energy to think about his preferences may simply guess at an answer to a WTP question. If this is simply a random guess, such behaviour would increase the variance of WTP bids in a sample of respondents without chancing the expected value of the mean or “true” WTP. If there is a pattern to these guesses, perhaps derived from cultural norms or customs, such as “hypothetical bias” may be introducing systematic errors into the WTP bids.

Despite these potential pitfalls, recent assessments of contingent valuation studies suggest that self-reported preferences from WTP questions for goods and services with use value (such as water and sanitation services) are generally much more reliable than economists have traditionally thought (Mitchell and Carson, 1989).

In particular, research findings from a number of studies in industrialized countries fail to support the hypothesis that respondents will act strategically when answering WTP questions. Recent CV studies in developing countries have similarly demonstrated that respondents in both urban rural locations give apparently reasonable answers to WTP questions about improved water services and that these answers are systematically related to their socioeconomic characteristics (Whittington, et. al., 1992). There is little evidence yet, however, that such

conclusions about the absence of strategic bias can be generalized to other developing countries or to different cultures.

ii) Miscommunication between the enumerator and the respondent

If a survey is not well designed, it is easy for the enumerator to ask a question that he or she thinks is clear, but for the respondent to interpret it differently than was intended. In such cases, the respondent may answer the question he heard honestly (accurately) , but this answer is not to the question that the enumerator thought he or she asked. These kinds of problems arise in part because certain words mean different things to different people and because survey researchers tend to impose their own conceptual framework on problems and situations that respondents understand quite differently. Such risks of miscommunication are especially acute in cross-cultural surveys.

There is considerable evidence from public opinion polls that people have particular problems understanding certain kinds of questions that depend on insight into their own feelings or their memory of events or feelings. Contingent Valuation questions related to environmental policy are very susceptible to such problems because attitudes toward such issues as environmental degradation and the preservation of species evoke deeply held moral, philosophical and religious beliefs.

One particular aspect of this problem has been of central concern to CV researchers. In some cases, respondents may interpret the hypothetical offer of a specific good or service to be indicative of an offer for a broader set of similar goods and services. For example, if a respondent was asked for her willingness to pay improved water quality in a specific river, she might misinterpret this question to mean her willingness to pay for cleaning up all rivers in a region or country. In this case, her answer(s) to the willingness to pay question(s) would not reveal the value sought by the enumerator. This is referred to as the “embedding problem” because the value of the good or service ,the CV researcher is seeking is embedded in the value of the more encompassing set of goods or services reported by respondent.

iii) Problems involved with aggregation of individuals’ responses to CV questions

Most analysts working in the Contingent Valuation field have been worried about the accuracy and reability of responses to CV questions at the level of the individual, but problems of aggregating individuals’ responses may in some circumstances be equally or even more important. Analysts often wish to (1) summarize respondents’ answers to valuation questions in terms of the mean willingness to pay for the good or service , or (2) develop an aggregate benefit estimate for a community or region.

Even if all respondents answered the valuation questions truthfully, such attempts to summarize information from a sample of respondents can suffer from two types of problems: sampling errors and insufficient sample size. Although these problems are not unique to CV surveys, they are often overlooked by analysts primarily concerned with potential biases that may arise at the individual level.

Non-Random Samples

There are numerous kinds of sampling errors that can arise in the implementation of CV surveys. For example, a non-random sample of the general population may be indadvertenly selected, making accurate extrapolation of results from the sample problematic. This is a particular risk in developing countries where good sample frames are typically nonexistent. Second, a non-random sample may result from non-responses to the questions. Non-responses are a particularly acute problem in contingent valuation studies because it is likely that individuals who refuse to answer valuation questions are not randomly distributed in the population. For example, they could be the most educated or the highest income individuals.

Insufficient sample size

Even if the analyst obtains a random sample, if the size of the sample is small, there is a “substantial” risk that the characteristics of the sample will not be representative of the general population.In the past many contingent valuation studies have been based on very small samples and as a result their findings are typically subject to wide confidence intervals.

2.2.5.5. Testing for biases and errors in contingent valuation studies

There are two ways of minimizing the risk of some of the errors and biases described above. First, contingent valuation researchers have devised ways of minimizing the occurrence of some types of errors and biases. Second, even if the probability of the occurrence of certain types of errors and biases cannot be reduced, the cost of being misled by poor quality estimates can be reduced by finding out whether or not a particular bias exists. In come cases, the magnitude of the bias can be estimated and the estimates of respondents’ willingness to pay can be corrected to remove this bias.

For example, suppose a CV researcher is worried about the possibility of strategic behaviour on the part of respondents. The first approach would suggest that the analyst construct a hypothetical market scenario that would make it difficult for a

respondent to determine how to behave strategically, or would encourage him not to behave strategically. A statement such as the following might achieve this objective: It is important that you answer these questions as-carefully and honestly as possible. If you say an amount higher than you can really afford to pay, then if the good (service) may not be provided and you will have to continue with the existing situation. So, please tell the truth.

Of course, it would not be plausible to include this kind of statement in may settings because it assumes that the CV study is being conducted under the auspices of an institution that can actually control an investment or policy. Nevertheless, it serves to illustrate the point that respondents can be encouraged to avoid strategic behaviour. One of the principal criterion for selecting an elicitation procedure is, an fact, whether it provides an opportunity or creates an incentive for a respondent to act strategically. One of the main reasons many CV researchers prefer the referendum question format is that it is incentive-compatible:a respondent can do no better than reveal his or her true willingness to pay for the good or service.

There are several procedures for implementing the second approach. Experimental design procedures can and should be use to detect whether subgroups of the overall sample respond to changes in the survey instrument in the way one would expect. For example, one could divide the sample of respondents into two groups and present one group with a statement that encourages strategic behaviour and present the second group with a statement designed to minimize or reduce strategic behaviour. If such a test uncovers strategic behaviour in the first group, then the analyst can adjust the estimates to remove the bias.

In general, many kinds of experiments can be designed for CV surveys in which different “split samples “ of respondents are given different questionnaires so that analysts can check to see whether such “ treatments “- or variations in the questionnaire- result in different willingness-to-pay responses. Comparisons of means or multivariate analyses are commonly used to test whether the effect of the treatment is statistically significant. Such tests may include checks for:

(1) Starting point bias, i.e., different subsamples are given the same elicitation procedure but with different initial amounts specified in, for example , a bidding game

(2) The effect of different elicitation procedures, i.e., different subsamples are given different elicitation procedures.For example, some respondents may

receive a single, direct open-ended question and other respondents may receive a bidding game with threeYES/NO questions.

(3) The effects of “time to think”- i.e some respondents may be given a day or more to reflect upon their answers to willingness-to-pay questions, while others may be asked to answer the question immediately (Whittington et.al.1992).

(4) The effects of question order- if respondents are asked to value two or more goods or services, then the order of the valuation questions can be changed for different subsamples of respondents. In general, the order of the questions would not be expected to influence respondents’ valuation information. If it did, this would suggest a problem with the CV results.

(5) The effects of providing more or less information about the good or service- i.e., respondents’ valuation of the good or service may depend on how much they know about it.

One of the most powerful ways of checking the reliability of the valuation information is to carry out multivariate analyses of the determinants of the valuation responses (Mitchell and Carson, 1989). In order words, the analyst examines how respondents’ willingness to pay varies with changes in the socioeconomic variables suggested by demand theory, such as income, education, family composition, housing conditions, ect. If such multivariate analyses indicate that:

(a) Variation in individuals’ responses to valuation question cannot, at least in part, be explained by the models; and

(b) The main socioeconomic variables do not affect individuals’ willingness to pay as hypothesized;

then the CV researcher must be concerned about the quality of the valuation information obtained.

The use of siplit-samples to test for accuracy and reliability of WTP responses be quite tricky and requires considerable care in survey design. It is often a much more subjective process than many analysts would like to admit. For example, several early studies in the contingent valuation literature introduced variations in the method of payment for the good or service offered. The assumption was that respondents would be indifferent about modes of payment. When the surveys revealed that individuals were in fact not indifferent, the analysts claimed to have discovered a “payment bias” in responses to contingent valuation questions. On

further reflection, most researchers concluded that this was not in fact a “bias” but legitimate preference regarding the way people wanted to pay for a good or service.
Another approach that can be used to increase the analysts’ confidence in the quality of the CV data is to compare the CV estimates with estimates obtained from other, indirect valuation techniques. Unfortunately, this is often not feasible due to data limitations and other difficulties. Whenever possible, such comparisons should be attemped, but they should not be interpreted as simply a “check” on the CV estimates. Indirect estimates are themselves susceptible to a variety of errors and biases, and should not be used as a standard or benchmark against which to judge CV estimate. If a comparison of CV estimates and estimates obtained with an indirect valuation techniques indicates that the two valuation methods provide roughly similar answers, then the analysts can place more confidence in the accuracy of both (Cumming, et.al.,1986). On the other hand, if the estimates obtained with the two approaches are different, then the analyst is required to make a more complex judgment as to which one is likely to be more accurate.

2.2.5.6. Techniques of Asking Contingent Valuation Questions

There are three commonly used techniques of asking contingent valuation questions. Iterative bidding, payment cards and dichotomous choice.

Iterative bidding is the oldest and most commonly used contingent valuation technique. In this technique is that the bidding process helps respondents to evaluate their preferences. Weakness of this technique is that initial bid can influence respondents final bids. As in all CV studies, the first step is to describe the item to be valued and a hypothetical market for trading the item to a respondent. A traditional willingness to pay application begins with an interviewer suggesting an initial bid.If the respondent is willing to pay the initial bid, the interviewer revises the bid upward until a negative response is obtained. A negative response to the initial bid results in the interviewer revising the bid downward until an acceptable amount is found.

Payment card as developed by Mitchell and Carson portray a range of dollar values beginning at zero and increasing at fixed intervals.The application of anchored payment cards involves describing the item to be valued and the hypothetical market for trading the item,as well as obtaining information on the respondents’ income. The interviewer then shows the respondent a payment card corresponding to his or her income category,explains the information on the card and asks the respondent to state a value for the item in question considering his or her

household's annual income and the information provided on the card.This reponse is final and no bidding is involved (Boyle et.all.,1988).

In a Dichotomous Choice application, the item being valued and the hypothetical market for trading this item are described to respondent as is done for other CV techniques. Respondents then are asked to state whether they accept or reject a single take it or leave it offer for the item being valued. Respondents are not asked to state a specific dollar value. The argument in favor of this approach is its simplicity for application in a survey format.Rather than having to deal with complicated bidding formats, survey respondents have to provide only a yes or no response to a single dollar offer.

2.2.5.7. Analysis of willingness-to-pay responses

The information obtained from contingent valuation surveys is typically analyzed in three, increasingly sophisticated ways. First, analysts examine the frequency distribution of the responses to the valuation questions. Second, analysts look at cross-tabulations between WTP responses and such variables as socioeconomic characteristics of the respondent and attitudes toward the environment. Third, analysts use multivariate statistical techniques to estimate a valuation function that relates the respondent's answer to the socioeconomic characteristics of the respondent and attitudes toward the environment. The types of statistical procedures utilized are dependent on whether the respondent answered a direct, open-ended valuation question or a YES/NO question.

The purpose of all three types of analyses is twofold:

(a) to see whether respondents' answer are consistent with theory and common sense (this increases one's confidence in the accuracy and reliability of the information);

(b) to establish statistical relationships or models that can be used in the aggregation of sample responses to the overall population under study, or for developing forecasts of benefits under alternative future scenarios.

Before any of these analyses can be undertaken, the data must be "cleaned" by removing protest responses given by individuals who for one reason or another reject the hypothetical scenario and refuse to give meaningful answers.

2.2.5.8 Treatment of protest responses

In any contingent valuation study, there will generally be some small percentage of the respondents who will give implausible answer to the valuation question. These

responses are commonly termed “protest bids” because the respondent may be “protesting“ the nature of the interview or scenario offered, rather than revealing anything about his or her value of the good or service. Protest bids can be either zero bids or very high bids, depending on the context of the valuation question. In a given data set, one may find both high and low protest bids.

The task of the analyst is to remove protest bids from the data set because this information wil bias the conclusions. Of course, not all zero bids or “very high” bids can be considered protest bids: some respondents may legitimately place no value on the good or service offered and others may value it very much. Since there is no independent criterion against which an analyst can judge the plausibility of a particular respondent’s answer, the appropriate treatment of protest bids requires skill and judgement on the part of the analyst. A variety of strategies and “rules of thumb“ have been used to “filter” or “sift” out protest bids from a contingent valuation data set.

For example, one strategy would be to set an upper limit on how much higher a respondent’s bid could be above the mean bid of the sample. For example, an analyst could decide to consider any bid two standart deviations above the mean bid to be a protest bid. Another strategy would be to see whether respondents very bidding very high or very low have the socioeconomic characteristics one would expect to be associated with such a response. For example, it is more plausible that a respondent with a very high income would offer a high WTP bid than a respondent with a low income. The analyst might decide that WTP bids from respondents in the lowest income were one standard deviation above the mean WTP bid of some sample should be considered protest bids. Judgements of this kind are obviously arbitrary and should only be made after careful consideration of field conditions, first-hand experience with the interviews, and a thorough analysis of a data set.

When telephone or in-person interviews are used, the kinds of statistical procedures described above to identify protest bids can be supplemented with more qualitative information obtained from the person conducting the interview. The enumerator may be asked to rate the quality of the interview and provide an asssessment of whether the respondent tried to answer the valuation question truthfully. One strategy would be to simply eliminate all interviews that enumerators judged to be of “low quality“ or those that enumerators felt that respondent did not try to answer truthfully. Such a procedure could, however, inject a variety of other biases into the data. A better alternative is to use both the quantitative and qualitative information to identify protest bids. For example, the analyst could create a rule that bid two standard

deviations above the mean bid and that enumerator judged to be poor quality would be considered a protest bid and would discarded from the data set.

For purposes of illustration, consider a situation in which the potential protest bids in a particular contingent valuation data set are all zero bids, and the analyst must decide which ones remove from the data which ones are legitimate values. The appropriate treatment of potential protest bids must lie somewhere between two extremes. On the one hand, the analyst could simply discard all zero bids. This strategy would probably remove some valid zero bids and as a result the analyst would conclude that the willingness to pay of the sample is higher than it really is. On the other hand, the analyst could take the conservative position that all zero were legitimate value; this would lower estimates of the sample's willingness o pay. Strategies for some of the zero bids because they were judged to be protest bids would lead to conclusions somewhere these two extremes. In such a case the analyst should conduct his or her data analyses with at least data sets: (1) one in which all zero bids were included in the data set, (2) one in which all zero bids were out of data set and (3) one in which some of zero bids have been deleted because they were judged to be protest bids. This approach will show the sensitivity of the final results to assumptions about how bids are treated.

2.2.5.9. Frequency distributions of WTP responses

i) Answer to direct, open-ended questions,or multiple YES/NO questions

Respondents' answer to direct, open-ended valuation question yield a data set of "point estimate" of individuals' willing to pay (i.e., we have a specific WTP value for each respondent). Answer to multiple YES/NO questions (i.e., biddinggame) place each respondent's willingness to pay in an interval defined by the last value accepted and the last value rejected. If these intervals are "tight", the analyst may feel that not much information is lost by making the assumption that each respondent's willingness to pay can be estimated by the mid-point of this interval. In this case these mid-points also provide a set of point estimates of individuals' willingness to pay.

Descriptive statistics such as the mean, median, and frequency distributions can easily be prepared for data sets of point estimates of WTP, and are often of particular value for policy purposes because that are easy for the noneconomist to understand and interpret. Two kinds of insights are often sought from such summary data. First, mean estimates of WTP or the frequency distribution of WTP can be used to develop preliminary estimates of the total value of the good or service,

i.e.the total economic benefits. Second, the frequency distributions can be used to estimate the percent of the population that would choose to purchase the good or service if it were offered at a specific price.

ii) Answers to single YES/NO question (referendum model)

The answer to single referendum valuation question can be summarized in a manner that provides similar information to the frequency distribution of point estimates described above. Recall that the implementation of the referendum model requires that respondents in different split-samples be asked how they would vote on a proposal that would provide a good or service at specified price, and that respondents in different split-samples are offered the good or service at different prices. It is a straight forward calculation to determine the percentage of respondents in each split-sample that agreed to pay the stated price (i.e. that voted for the proposal).

2.2.5.10 Cross-tabulations of WTP responses with socioeconomic chracteristics of the respondent and attitudes toward the environment

i) Answer to direct, open-ended questions or multiple YES/NO questions

The next step in the analysis of contingent valuation data is to determine whether different groups of people in the sample gave different responses to the valuation question(s). These analyses begin to address the questions of who is willing to pay the most (and the least) for the good or service, and why. The answers to these questions are relevant both for an assessment of the accuracy and reliability of the WTP responses, and for policy inferences that may be drawn from the data.

When point estimates of willingness to pay are available for respondents, the analyst can calculate the mean WTP bid for different groups of respondents.

ii) Answer to single YES/NO question (referendum model)

It is possible to prepare cross-tabulations of answers to referendum questions and socioeconomic and attitudinal information based on split samples, but this requires very large sample sizes. For example, consider an experimental design in which 1000 households were interviewed and asked how they would vote on a specific proposal if it were offered at a set of specified prices. Suppose that five different prices were offered to five split-samples so that 200 household received the first price,200 households received the second price and so on. For each split-sample one would calculate the percentage of respondents that voted for the proposal.

Now, it would be possible to take one of these split samples and divide these 200 household into two or more groups based on socoieconomic or attitudinal variables and then calculate the percentage of respondents in each of these groups that voted for the proposal. This procedure could be repeated for each of the four remaining original split-samples to see if the effect of the groups on the percentage of affirmative responses was consistent in each of the five groups. The problem with this procedure is that many contingent valuation studies that use the referendum model include experimental designs with other treatments. As a result the size of the groups of respondents based on the socioeconomic classification is so small that it is difficult to discern anything except very large effects. There are simply not enough independent observations or degrees freedom to carry out tests of differences between groups that have much statistical power.

2.2.5.11 Multivariate analyses of the determinants of WTP responses

i) Answer to direct, open-ended questions

The use multivariate analysis can provide better information and greater insight into the factors that affect the WTP responses than simple cross-tabulations. The general approach is to estimate a valuation function that relates the hypothesized determinants with the WTP responses. The decision on what determinants of WTP should be included in the valuation function is typically based on consumer demand theory. Socioeconomic and demographic characteristics of the household (SE) and prices and availability of substitute goods and services (Ps) are commonly used. The valuation function thus takes the form

$$WTP_i = f(SEi, Psi) \qquad (2.1)$$

Where i is an index of households in the sample.

Since the answers respondents give to open-ended question provide a continuous measure of willingness to pay for the good of service, in this case ordinary least squares (OLS) models can generally be used to explain the variations in the dependent variable (WTP bids). OLS techniques have the advantage of being widely used, and the parameter estimates are easy to interpret. OLS requires of course, that the determinants of the WTP responses be exogenous in order for the parameter estimates to be consistent. This may be a questionable assumption for some attitudinal variables. For example, WTP for environmental quality improvements and the responsibility one feels for environmental cleanup may be jointly determined.

ii) Answers to a single YES/NO question (referendum model)

Since in this case the response to the valuation question is a not a continuous variable, but rather a discrete response, OLS techniques are not approprite for the valuation function. Instead, analysts utilize a variety of discrete models to attempt to explain the probability that a respondent will give a yes response to the valuation question. In this case the valuation model attempts to explain the respondent's answer to the referendum question as a function of the same kind of independent variables used in the OLS models described above:

Yes =1

$$= f(SEi, Psi) \qquad (2.2)$$

No = 0

Either a logit or a probit model can be used to estimates this relationship. The results of such discrete choice models can be used to derive estimates of the economic value of the good or service offered in the contingent valuation scenario.

Such discrete choice models can be also derive estimates of the relationship between the percentage of respondents agreeing to pay and the price offered that control for socioeconomic characteristics of the respondents and other factors.

2.2.5.12. Application Steps of the Contingent Valuation Method

Hanley (1990) identifies the six phases in the practical application of CVM as follows:

Stage 1:Preparation

i.Setting up the hypothetical market : Individuals may be presented with two basic variants:

-How much are you willing to pay (WTP) for a welfare gain?

-How much are you willing to accept (WTA) in compensation for a welfare loss?

ii. Define the elicitation method: The major alternatives:

-Open ended; "how much are you willing to pay?" This approach produces a continuous bid variable and may therefore be analysed using least squares approaches(OLS).

-Take it or leave it (dichotomous choice); "are you willing to pay X TL ?" the amount X being systematically stepped across the sample to test individuals'

responses to different bid levels. This approach produces a discrete bid variable and requires logit type analysis.

-A recent variant upon the dichotomous approach is to supplement the initial question with an iterative second round (double bound) question .(Haneman et al.,1991). For example, if the respondent answers yes to the X TL bid then they are asked if they are WTP 2X TL (or 0.5X if they answered no to the initial question).

iii.Provide information regarding:

-the quantity/quality change in provision of the good

-who will pay for the good

-who will use the good

iv.Define the payment vehicle, for example :

-higher taxes

-entrance fees

-donation to a charitable trust

Stage 2: Survey

Obtaining responses to the questionnaire.

Stage 3: Calculation

Calculate the mean WTP (or WTA) from responses. This commonly involves the omission of protest votes and/or the use of trimmed means. In a dichotomous choice, format experiment the mean is obtained by calculating the expected value of the dependent variable (WTP or WTA) .

Stage 4: Estimation

A bid curve can be estimated to investigate the determinants of WTP bids. For a continuous question format OLS estimation techniques are often employed. Typically, in WTP scenarios, the bid curve will relate bids (WTPi) to visit (Qij), income (Yi), social factors such as education (Si), and other explanatory variables (Xi). A parameter of the environmental quality of the site (Ei) may also be included.

$$WTPi = f(QijYi, Si, Xi, Ej) \quad (2.3)$$

There is no theoretical correct form of this function. However, if a log-log function is chosen then the coefficients are elasticities. In such a case the bid curve allows us to estimate changes in mean WTPi arising from changes in Ej. Indeed if the other relationships are sufficienlty stable then we can use this curve to evaluate changes

to other strongly related environmental goods, eg. İmpacts of water quality change upon wetland quality.

If a dichotomous payment format has been used then a logit approach is required, relating the probability of a yes answer to each suggested sum to the explanatory variables listed above.

Stage 5: Aggregation

This is required in order to move up from mean WTP to total value. This entails decisions about, for example, moving between household and individual data and distinguishing the relevant population.

Stage 6:Appraisal

Was the CVM successful?

To answer the question posed in stage 6 we need to consider the technical acceptability of the evaluation estimates produced by CVM. However, before we do so it should be emphasised that in practice this is the only one of the criteria upon which both CVM and all other evaluation method are likely to be judged (Bateman and Turner, 1992).

2.3. Benefit Transfer

Environmental benefits transfer, i.e. transposing monetary environmental values estimated at one site (study site) to another (policy site) has been discussed and applied extensively.

To obtain an estimate of the economic value of the consequences of a similar project that had been implemented in a different location and then to assume that this existing estimate of economic value could be used (perhaps after some adjustment) as an aproximation of the economic value of the proposed project.

The most important reason for using previous research results in new policy contexts is cost-effectiveness (Brouwer, 2000). Environmental value transfer has been applied extensively in various natural resource policy contexts, ranging water quality management Luken et al.(1992) and associated health risks Kask and Shogren (1994) to waste Brisson and Pearce (1995) and forest management Bateman et al.(1995).

The validity of environmental benefit transfer can be tested in a number of ways. Which test is most appropriate depends on the distribution of the WTP amounts.

It was shown that the validity tests for using in benefit transfer in Table 2.2 (Brouwer and Spaninks, 1999).

Table 2.2 Validity Tests for Benefit Transfer

TESTS
t-test/Mann-Whitney test
Kolmogorov-Smirnov test
Lagrange Multiplier/Wald test
Chow/Likelihood Ratio test

BT is appropriate when certain conditions are peresent:

-There are insufficient funds,time or personnel to undertake a satisfactory new study
-The study site is similar to the policy site
-The issues (e.g. proposed policy change or nature of project) are similar in the two cases

2.6. Meta Analysis

Recent years have seen a growing interest, both from academics and policy makers, in the potential for producing generally applicable models for the valuation of non-market environmental goods and services which do not rely upon expensive and time consuming original survey work but rather extrapolate results from previous studies of similar assests.

Meta-analysis is the combination of data from several studies to produce a single estimate. From the statistical point of view, meta-analysis is a straightforward application of multifactorial methods. A specialist has several studies of the same thing, perhaps carried out in different countries. Each trial gives him an estimate of an effect. Then he assumes that these are estimates of the same global population value. He checks the assumptions of the analysis, and, if these assumptions are satisfied, he combines the separate study estimates to make a common estimate.

Meta-analysis is the statistical analysis of the summary findings of empirical studies (Barton,1999). In the relevant literature a distinction has been made between primary analysis, secondary analysis and meta-analysis. Primary analysis is the original analysis of data in a research study.Secondary analysis is the re-analysis of data for purpose of answering the original question with better statistical techniques

or answering new questions with old data. Rather than analyse primary data or conduct a re-analysis of secondary data, meta-analysis treats each study as one observation in which e.g. mean WTP is the dependent variable and the significant parameter estimates, as well as dummy variables describing methodological differences , constitute the explanatory data. The most common use of meta-analysis to date in the valuation literature has been the analysis of variations in welfare measures due to differences in methodological assumptions of CV,TC and HP studies (Boyle et al.1994; Brouwer et.al. 1997; Smith and Huang 1993; Walsh et.al. 1992).

Meta – analysis has been developed over the last thirty years, mainly in the field of experimental medical treatment, phychotherapy, learning, education and skills. Typically, these experiments took place in rather well-controlled circumstances on the basis of relatively standart designs and standart measurement. Meta – analysis helps us to extract information from large masses of data presented in studies in order to quantify a more comprehensive assessment which can complement a narrative or more qualitative analysis. As such, meta-analysis is to be seen not as a substitute, but as an important supplement to qualitative analysis (Van Den Bergh and Button, 1997).

Important advantages of meta-analysis are, first, that does not prejudge research findings on the basis of the original study's quality and so is said to avoid selective inclusion. Secondly, it avoids a differential subjective weighting of studies in the interpretation of a set of findings. Thirdly, meta-analysis offers a transparent structure with which to understand underlying patterns of assumptions, relations and causalities, so permitting the derivation of useful generalisations without violating more useful contingent or interactive conclusions (Hunter et. al., 1982).

However, a significant disadvantage of meta – analysis is that it is often biased towards including significant study results only, since it will be likely that insignificant study results will not be published. Furthermore, multiple results fro the same study are often treated as individual, independent observations without explicit testing of the implicit assumptions of such an approach.

Since the beginning of the 1990s, meta-analysis has started to play a more important role in environmental economics research, in particular in the field of environmental valuation. Analyses have focused on a range of environmental issues, from outdoor recreation to urban air pollution, based on single or multiple valuation techniques. The increase in meta-analytical research seems to have been

principally triggered by : (1) increases in the available number of environmental valuation studies; (2) the seemingly large differences in valuation outcomes as a result of the use of different research designs; and (3) in view of the high costs of carrying out environmental valuation studies, the increasing demand for transferable valuation results.

Table 2.3 gives an overview of meta – analytical research carried out in the field of environmental valuation. This has tended to focus on similar public goods or services, the values of which have been estimated using the same valuation techniques. Hedonic property (HP) models have been used to detect the influence of air pollution on housing prices. TC based valuation studies focus on outdoor recreation demand in general and fresh water recreational fishing demand in particular. The two CV based meta-analysis focus on improving the visibility at national parks in the United States and woodland recreation in the United Kingdom. Only two studies are based on a combination of valuation techniques, one of which moreover considers three broad classes of quasi – public goods (Carson et. al.,1996). The values included in this study cover a wide range of environmental benefits, ranging from recreational fishing to occupational risks expressed in terms of statistical values of life.

Table 2.3 An Overview of Meta – Analytical Researches

Study	Topic	Valuation technique
Smith and Huang (1993,1995)	Air pollution	HP
Smith and Kaoru (1990)	Outdoor recreation	TC
Sturtevant et al (1995)	Fresh water fishing	TC
Smith and Osborne (1996)	Visibility at national parks	CV
Bateman et al. (1995)	Woodland recreation	CV
Walsh et al. (1992)	Outdoor recreation	CV,TC,(unknown) other valuation techniques
Carson et al. (1996)	Recreation,environmental amenities,health risks	HP,TC,CV,defensive expenditures, actual market data

Results from these analyses suggest that differences in study design play an important role in explaining the variance between valuation outcomes. In the HP based studies, besides local property market conditions, the type of data and model specification employed in each study helped to reveal significant negative relationships between housing prices and air pollution measures. In the TC based studies, significant differences were found regarding (1) the overall statistical specification of the TC model (2) the specification of the opportunity costs of time and (3) the inclusion of substitute prices.

Differences in CV outcomes have been analysed in great detail in individual studies by looking at the effect of varying single research design elements on stated preferences. Significant differences have been found in valuation outcomes in individual studies with different survey design.

3. THE APPLICATION OF CONTINGENT VALUATION METHOD

3.1. Introduction

This section describes the general information about the study area and Köyceğiz Dalyan Environmental Protection project and finally the definition of the survey steps ; survey format, survey design and results of the pretests.

3.2. General Overview of the Study Area

Environmental pollution and destruction of habitats together with degradation of ecosystems due to recent exponential increase in the world's population have drastically influenced the nature and natural resources of Turkey. To remedy such very complicated problems and obstacles in the region, the governments of the Mediterranean countries approved a Mediterranean Action Plan (MAP) in 1975. Afterwards, together with European Community (EC) the member countries signed Barcelona Convention. The convention aims "to protect the natural beauties of the protected areas and their surroundings, the archeological sites, the ecological balances and the living and non-living goods above and under water and to create the basis for passing these goods to future generations" in 1982, the governments signed a protocol which enables them to do special protection to endangered fauna and flora as well as the whole areas including their habitats which are vital for their survival.

Between 1988 and 1990, the Cabinet of Ministers declared twelve Specially Protected Areas (SPAs) according to the addendum protocol of Barcelona Convention. Twelve SPAs are determined and nine of them are settled on the coastal part of the Mediterranean and Agean seas (Köyceğiz-Dalyan, Fethiye-Göcek, Gökova, Patara, Kekova, Goksu delta, Foca, Datca-Bozburun and Belek). The rests are located inner parts of the country (Gölbaşı,Pamukkale and Ihlara) (Yüksel and Keskin, 1993). The next step following declaration of SPAs was the establishment of "The Authority for the Protection of Special Areas" (APSA) in 1989. The main purpose was to protect the environmental features of these areas, to eliminate the existing environmental pressures, to take the necessary measures and the basic principle for the protection and implementation of plans and their revisions.

Some part of the Köyceğiz-Dalyan area has declared as the Special Protection Areas in 1988, because of its unique structure that forms an example of an important ecosystem with a high diversity of species and of intense biological activity. In 1990 Köyceğiz and Ortaca Districts were included in the boundries of the Special Protection Areas increasing it up to a total area of 385 km^2.

The region is a watershed complex composed of lake, lagoon and the sea. The watershed of Köyceğiz Lake/Dalyan Lagoon with an approximate surface area of 1200 km2 is situated at the southwest of Turkey where the Lake joins the Lagoon and the Lagoon joints the Mediterranean Sea.

Köyceğiz and Dalyan towns, where the survey was conducted, situated in Köyceğiz-Dalyan watershed area as shown in Figure 3.1.

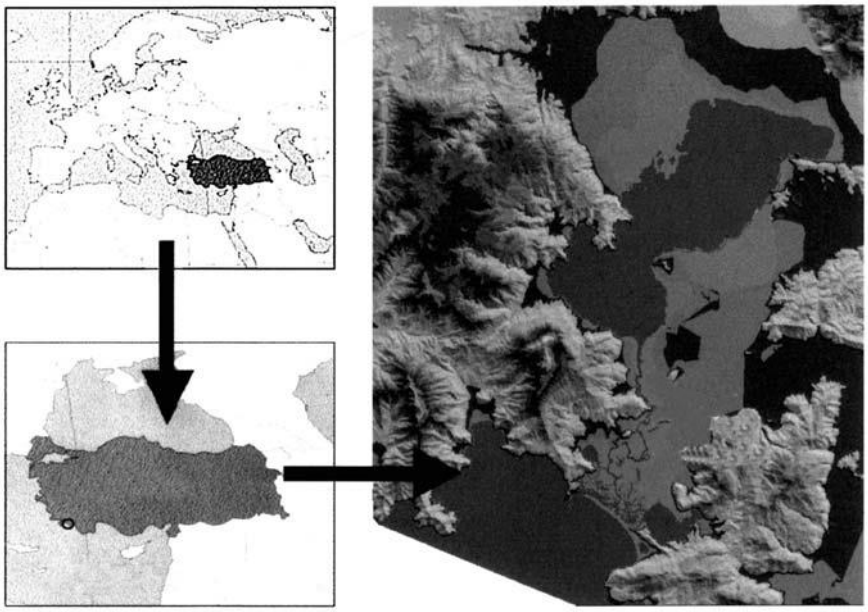

Figure 3.1 Location and 3D view of the Study Area of the Lagoon System

Each SPA has its own peculiar characteristics throughout the country and the region. Iztuzu beach is one of the most important nesting places for the sea turtles Caretta Caretta in the Mediterranean region which are now under special protection. According to a research conducted by the University on behalf of APSA, 700 species of flowering plants, ferns and conifers are found in the region. The most important and popular plant species is the endemic oriental sweet gum tree (Liquidambar orientalis) variety which could never been found anywhere all over the world, including Honduras. Bird species such as coot, stork, white-breasted kingfisher, swallow, reed warbler, gullbilled tern, gull,little egret use this area for nesting and breeding. Mediterranean maquis, reeds and marches compose the major vegetation types in the area whereas the hills are forest zones.

The region in ancient times was called Caria. Throughout the centuries many civilisations such as Hellenistic,Lycian,Persian,Egyptian,Syrian,Pergamon and Byzantine civilisations influenced the society of Caria. Ruins of theaters, Roman bath,Palaestra and the ancient city walls have relatively been kept well in Kaunos today.

The climatic condition of the area is characterized by the Mediterrainean climate where dry and hot summer season and warm and rainy winter season are the main characteristics. The survey was completed in June,2002. During the survey, the weather was warm. The weather conditions should be possitive effects to the survey.

There exists no field study on the air quality of the watershed. However, coal with a high content of sulfur is used for heating purposes. High SO2 is the main cause of air pollution which is highly directed by the local topography and meteorological conditions.

3.2.1. Socio-economic Characteristics

3.2.1.1. Demographical Characteristics

The total population of watershed area is 43.585 according to the 1997 census, of which 74 percent of resident in the Köyceğiz Lake area and the rest in the Dalyan Channel Network drainage area. The largest town in the lagoon drainage area is Dalyan with a population of 3.357 according to the 1997 census, whereas Köyceğiz is the largest town in the lake drainage area with a population of 7.526.

The population of the lagoon does not reflect a rapid and huge increase like other regions of Turkey where industrial activities are significant. As expected, there are no significant industrial activities within the area, which is an important factor promoting high population increase elsewhere in Turkey. It may be concluded that the economy of the watershed area is mainly based on agriculture, tourism, fishery and forestry. (Gonenc et.al., 2004) The population and annual population increase is shown in Table 3.1.

Table 3.1 Population and Annual Population Increase in Koycegiz and Dalyan

Year	Koycegiz			Annual Population Increase	Dalyan			Annual Population Increase
	M	F	Total		M	F	Total	
1970	2158	2029	4187	-	-	-	1858	-
1975	2355	2257	4612	0.019	-	-	2587	0.068
1980	2707	2639	5346	0.029	1409	1550	2959	0.029
1985	3129	3103	6232	0.031	1485	1629	3114	0.010
1990	3319	3087	6406	0.005	1572	1521	3093	-0.001
1997	-	-	7526	0.024	-	-	3357	0.012
2000	-	-	7523	-0.00013	-	-	4848	0.148

M: Male; F: Female

To sum up, the population data indicate that there is no important emiggration from the region, the rural area is approaching saturation point, and urbanization is on the rise in Dalaman and Ortaca , whereas Köyceğiz cannot keep up with them.

3.2.1.2 Social Facilities

A major social problem of Köyceğiz and Dalyan is that they were not able to develop a social structure and policy which corresponds to their development level. Education level of people and social activities are not parallel to economical developments.. Educational levels and social activities in Köyceğiz are more developed than Dalyan. There are two high schools and three vocational high schools in Köyceğiz.

Efforts are ongoing to change the vocational high school for aquatic products to a technical school. Köyceğiz Municipality owns a library which has 4.772 subscribers. Young people attend the activites of the public education center.

According to the information gathered from the State Institute of Statistics of Turkey (SIS) in the population of Koycegiz there is a high concentration of young people between the ages of 10 and 34. The average household population in Koycegiz varies between three and four. Although the number of literates is high, most of them are primary school graduates. The number of men and women is almost the same, but the number of literate men is three times that of women. The ratio of university graduates is 7 percent. It can be stated that the number of people willing to have university education is low, as the young generation prefers to take part in trade activities at an early age. There are two hospitals and six village clinics in the watershed.

3.2.1.3 Nongovernmental Organizations in Watershed Area

There is no effective civil organization in the watershed area except the Association of Trades and Crafts, agricultural cooperatives and the fishery cooperative (DALKO).

Association for Tourism, Culture and Environmental Protection in Dalyan, founded in 1990, firstly became known for its campaign against a planned hotel construction on Iztuzu Beach. The Association managed to stop the construction by acting together with Greenpeace, several international environmental organizations and the Turkish Society for the Conservation of Nature.

The Turkish Society for the Conservation of Nature, centred in Istanbul, is an association that works effectively on local and international levels for the public interest. It has constituted a working group in Dalyan and works in cooperations with the Association for Tourism, Culture and Environmental Protection in Dalyan. This group has carries out audio-visual and educational activities in schools.

Table 3.2 Nongovernmental Organizations and Cooperatives besides Agricultural Cooperatives in the Watershed

No.	**Cooperatives and Associations**
1	Cooperative of Sea Boats Conveyers of Koycegiz-Dalyan
2	Cooperative of Drivers and Motor Vehicles of Dalyan
3	Cooperative of Trades of Koycegiz
4	Cooperative of Boat Conveyers of Dalyan
5	Association of Tourism, Culture and Environment Protection of Dalyan
6	Association of Protection of Goods of Farmers (Dalyan)
7	Association of Hunters of Dalyan
8	Association of Tourism and Nature Protection of Koycegiz
9	Association of Hunters of Koycegiz

3.2.1.4. Sectors and Their Characteristics

Agricultural activities are the major source of economic income in the watershed. Almost all the plains or lands closed to the plains are devoted to agriculture and the main agricultural crops like citrus fruits, cotton, sesame, corn and wheat and in higher regions olive groves enrich the vegetation cover. Land use of the region is

predominantly natural or agricultural. Forests and agricultural land cover approximately 85 percent of the watershed.

Some companies are engaged in ecological farming around Koycegiz; unfortunately despite all efforts, these attempts were not totally successful, since especially in the rural regions farmers could not be convinced to use these techniques.

Tourism is one of the major sectors in Köyceğiz and Dalyan. The number of beds at the accommodation facilities is low when compared to Turkey's average. Plenitude percent in Dalyan during July and August is 100. Almost all accommodation facilities were established at the ancient city area due to land and planning constraints.

National and international environmental organizations and scientists involved in the protection of *Caretta caretta* turtles have played a major role in the increase of tourism activities. Mud baths and hot springs are also major facilities that attract tourists.

Although an agricultural life style had been observed in watershed area, after tourism gathered impetus a substantial number of people have started to move to this sector. Dalyan's touristic potential is higher than that of Köyceğiz and the life styles and attitudes of the people living in Dalyan reflect the importance of the tourism factor. Conventional dependence to land - especially to cotton production- in Dalyan has changed entirely. Dalyan inhabitants thought that tourism had altered their life styles and traditional relations in a very short period of time. People living in Köyceğiz complain about unfair distribution of tourism incomes in favour of Dalyan which was once a district of Köyceğiz. Dalyan was a small town, administratively under Ortaca, but as a result of the development of tourism it now has a lively and commercial structure. On the other hand, Köyceğiz has recently started to develop some plans such as those concerning lake sports, summer pastures, and skiing on the Ulemez Mountain to attract tourism.

Fishery activities are carried out in Köyceğiz, Alagol, Suluklugol and Sulungur Lakes and the Iztuzu coast by means of a cooperative (DALKO), which has 507 shareholders and 60 employees.

There are no significant industrial activities in the watershed. The cotton gin processes the cotton collected from the neighborhood villages. Almost all companies are small-scale and located in the Köyceğiz Small Industry Site". Köytaş is a medium-scale enterprise producing equipment for agricultural activities and municipality services. A fish processing plant has been established in Beyobası. The citrus fruit processing company is important not only for reducing

unemployment during winter, but also providing economic income to Turkey through exports.Trade has flourished in Dalyan and Köyceğiz parallel to the development in tourism. 78 percent of the population in the Köyceğiz is engaged in agriculture and it is the major income source in the rural regions, whereas tourism is the major income source for Dalyan.

However, education level and social activities are more developed in Köyceğiz than in Dalyan and this makes a positive contribution to increasing the income of Köyceğiz.

There is a certain environmental sensitivity in Köyceğiz, but in Dalyan it has disappeared. The reason lies behind this process is Dalyan's increasing tourism income. Their sensitivity is directed to touristic activities. Almost all people in Köyceğiz-Dalyan have identified environment or protection concepts with the SPA practices.

As there are no industrial investments or enterprises in the Köyceğiz-Dalyan area, environmental pollution from industrial sources is not a significant issue, except for septic tanks and sewerage problems which everybody seriously complained about. Since perception of pollution is limited to these cases, the measures considered at primary level. The socio-psychological aspects of pollution have not been mentioned. Even though the respondents envision a Köyceğiz without noise, crowding, bad construction, etc., they do not think in terms of pollution.

3.2.2 Köyceğiz Dalyan Environmental Protection Project

Due to population growth and the development of tourism in the region as well as the absence of adequate wastewater treatment facilities, environmental pollution has just started to give warning signs that precautions have to be taken . This is especially valid for the water quality of the aquatic system which is one of the principal assets of the natural environment of the region.

The Köyceğiz Dalyan Environmental Project started in 1995 when APSA (Authority for the Protection of Special Areas) authorized a consultant company to do final design studies. Construction work started in 1999 and was completed in the second half of the 2002. The project consisted of the construction of new wastewater networks, pumping stations and wastewater treatment plants in both towns. The overall project cost was 42.4 Million DM .

APSA, as the agency responsible for the conservation area, applied for financial contribution to a German financial cooperation (KfW, Kreditanstalt für

Wiederaufbau). APSA financed 40 percent of the total costs and KfW financed 60 percent of the total costs as a grant within the framework of Turkish-German cooperation. There was no direct financial contribution to the project by the local municipalities or the population except for the construction of house connections.

The actors and their objective functions in the project

Although the two urban settlements depend extensively upon the agricultural revenues, their social and economic structure is differentiated and complex. The main characteristics of these social structures are described in detail in this section (APSA, 2000).

Kfw who financed the project wanted to guarantee that the money they donated was used for the expected goals and in the intended areas. In terms of the project, their aim was to acquire results at EU standards, with no deviation from these standards.

APSA recommends that the Köyceğiz Dalyan region should be a long-term conservation area. However, they are amenable to compromising in certain cases, and admit that total natural preservation is not possible. One of their principle policies is to limit new investments in tourism and to control the existing touristic capacity. In order to accomplish these goals, the organization, as a bureaucratic entity, formulates the regulations. APSA seems to have failed to a certain degree, in terms of creating connections with the local population and was further alienated by removing the decision making levels of the organization from the region. In all, APSA is not perceived by the local people as a positively contributing unit and their operations are considered as limiting and repressive.

The District Governor is the nearest governmental institution to the sources of the problems. The district governor is trying to protect the balances and shows an awareness for the preservation of ecological interests. However, the office relies on the traditional authority of the government and does not as yet seek other means of legitimacy. Furthermore, the office of District Governor is not a permanent one. Any change in the office creates uncertainties in terms of exercising the functions of the office. Although the government is perceived as the most permanent balance factor, there is a lack of trust in its impartiality. It should also be noted that the personal objective of the District Governor is to create the impression among the local people that the work is progressing smoothly and with no problems.

The Köyceğiz Dalyan Environmental Union was formed through the cooperation of the Provincial Local Government (district governor and head of the villages within

the project area) and the Dalyan and Köyceğiz Municipalities. The Union as an administrative body is responsible for the sustainable operation of the new facilities and future extension measures. However, its structure and composition relies on two basic elements that can potentially create difficulties as the work progresses. Firstly, the Union is composed of elected and appointed members and the District Governor is the natural chairman of the Union. Secondly, the Municipalities are using their membership in the union for short term advantages and benefits, instead of comprehending the long term goals of the project. Therefore, although the union might be an instrument for solving problems, it is highly possible that it may not function in that way if the conflicting attitudes of the units do not change. In all , the Union is theoretically one of the most important elements of the project, although there might be problems in its functioning.

Municipalities did not show a big interest in the real goals of the project. This lack of interest was based on the fact that the project would continue and progress without the municipalities' input. It should be noted that the municipalities have little economical power in Turkey. These municipalities have even less power due to being in the APSA region.

From the project point of view, the Köyceğiz community was less aggressive than the Dalyan one in terms of seeking short term profits from the tourism industry. Instead, the Köyceğiz community was interested in the job opportunities or income sources that the implementation of the project might create for them. However, there was general consensus that this infrastructure investment was crucial for the future of tourism in Dalyan. On the other hand, there was general concern that the construction work could hurt their small touristic businesses and this group was therefore keeping a close eye on how the construction project was being implemented.

DALKO as a fishing cooperative is concentrating its efforts to gain the maximum profit from the constantly decreasing fish sources and maximizing the income from fishing. In this sense, DALKO represented one of the major supporting local groups for the project. However, the relations between Dalko and APSA fluctuated depending on how much the decisions of the latter benefit the former. In all, Dalko appeared as one of the most important factors in public support regarding the actions in Dalyan.

3.3 Analysis of the questionnaire

3.3.1 The CVM Survey : Questionnaire

A survey was conducted to evaluate the benefits to households from reduced sewage pollution of surface and groundwater quality due to the wastewater treatment plants in Köyceğiz-Dalyan Area.

While the survey was being implemented, the wastewater treatment facilities had been constructed in Köyceğiz and Dalyan. According to an agreement signed between the Municipality and the contractor; after completion of the construction, the contractor would operate the plants for one year and no payment will be charged from the people for this period. The Municipality tried to make a payment plan for the addition the wastewater fee to water bills for the coming years. Since the Contingent Valuation Method (CVM) is the only practical means of estimating the environmental benefits, this method was applied in Köyceğiz Dalyan Area in June 2002.

The questionnaire, which is given in the appendix 1, was designed according to the results of reviewing some questionnaire samples in literature and discussions with the some environmental economists who were experts in that field. The questionnaire contains two groups of questions. The first group of questions is related to the valuation concept. They were dedicated to collect information regarding: The first set of considerations was the reliability of the service. People had to be informed how the existing system (septic tanks) had a trouble and remind them the Authority had precautions against to solve that problem. The second step was to be awared of the people about environment asking them what the opinion was about the pollution in the area and which areas of the region should be improved. The third step was related to explanation about the existing situation and some future assumptions and trying to get approval of WTP payment. If not, then getting the reasons that why they did not want to pay. The last step was respectively related to the questions about the socioeconomic and demographic characteristics of the respondents and her household (such as the like income, occupation and the ages and other features of the household). It was also checked whether the community believed that the operation of wastewater treatment plants will be a positive reaction against the pollution.

Households were asked their Willing To Pay (WTP) for the wastewater treatment system that would improve future water quality in the Köyceğiz Dalyan Area. In this survey, the valuation question is composed of two steps;

-The respondents were first asked whether they would vote in favor of making an extra payment in support of the operation of the wastewater treatment plant
-Those in favor were asked whether they would accept the bid amount

3.3.2 Survey Format : Single Bounded Dichotomous Choice

One type questionnaire was used ; Single bound DC Type. There commonly used techniques of asking CV questions are iterative bidding, payment cards and dichotomous choice. The single bounded Dichotomous choice approach was preferred. In this technique, the item being valued and the hypothetical market for trading this item are described to respondents, respondents then are asked to state whether they accept or reject a single take it or leave it offer for the item being valued.

The single bounded approach is the original approach format of Bishop and Heberlein (1979) where respondents were presented with a specific money cost to obtain a commodity and asked whether they would be willing to pay this amount. The DC type question has been the dominant form of CV question since Bishop and Heberlein (1979). The advantage of the DC question is that each respondent is asked a single valuation question that is relatively easy to answer. Another disadvantage is that larger samples are necessary to implement the DC approach. For each money amount, including in the experimental design, it is necessary to have large samples (n=300 or more) for statistical purposes.

3.3.3. Survey Design and pre-testing the Survey

The first visit to the site was realized in November 2001. The municipalities concerned were informed about the research. Following the site visit, a plan of the questionnaire was drafted. In June 2002, before the actual study was started, a survey was made to collect some background information regarding opinions about the current conditions and characteristics. Interviews were realized with people from business communities (hotels, restaurants and shops), local inhabitants and governmental agencies (Dalyan and Köyceğiz Municipalities, Köyceğiz/Dalyan Environmental Protection Union, and the Authority for the Protection of Special Areas), as well as non-governmental organizations.

Before starting the questionnaire, a sampling program was planned to decide on how the respondents were to be selected. City maps, including neighborhoods, were obtained from the Environmental Protection Union. Occupational group lists were obtained from the Municipalities. The strategy of the questionnaire was drawn up

according to these documents and the group was managed according to these figures after daily survey.

The questionnaire was pre-tested. This means that the questionnaire was tested on 20 randomly selected people to see whether the questions were clear and understandable to the general public. The main aim was to test the WTP question. The outcome of this test led to a few adjustments for some questions. As regards the WTP question, during the pre-testing of the questionnaire, a substantial number of people appeared to have problems in answering yes or no to a specific predetermined bid amount. The open-ended format was tried, however as the alternative mode of asking them instead for a percentage over and above their current water bills appeared to produce significantly less difficulties, this was subsequently considered to be the best way to ask respondents the WTP question. As a result of this observation, instead of asking respondents for their willingness to pay a specific money amount in a contingent valuation dichotomous format, the question was formulated to ask them whether they were willing to pay a specific percentage over and above their currently monthly water bill to operate the newly built wastewater treatment plant in their town.

The face-to-face interviews were carried out in June 2002. Because of the selected elicitation format, in order to get statistically reliable results, eight hundred people (400 households per town) were interviewed. The interviews took place at different public places in both towns. Each interview lasted on the average between 10 and 45 minutes. In total 7 interviewers, 5 women and 2 men, were used, all of whom were master or PhD students at the Istanbul Technical University. The interviewers were trained before going to the field. They were guided through the questions in the questionnaire one by one, and informed about the underlying reasons why specific questions were asked.

On the average, because of the time limitation, each interviewer was able to interview between 15 and 20 households per day. The interviewers were brought to the interview sites between 9:30 to 12:30 in the morning and picked up again between 13:30 and 18:00 (sometimes 20:00) in the evening. Each evening in the hotel, the interviewers were debriefed individually about the interviews.

During the survey, the attitude of the households was very positive to the project. Some of them complained that the authorities had not informed them about the project beforehand. The majority of the community agreed that this type of research had to be completed before the realization of such projects. The most important part

of this research was that before starting each questionnaire, respondents were informed that it was a research undertaken by the University and the results were to be kept confidential, specifically pointing out that it was not being done at the demand of any governmental authorities. (the municipality, Environmental Protection Union or the Department for the Protection of Special Areas) .When this was explained to the respondents, they felt more comfortable during the interview.

3.3.4. SPSS Program (Statistical Package for Social Sciences)

SPSS was used to analyze the questionnaire results. SPSS is a powerful statistical package for data analysis. It contains two parts ; variable view (appendix 4) and data view (appendix 6). After setting the variable view according to questions in the questionnaire,each questionnaire was entered into the data view.

4. RESULTS AND DISCUSSIONS

4.1. Evaluation of the questionnaire results

4.1.1. Evaluation of the frequency distributions of responses

As mentioned before in the Section three, the first step of the survey evaluation is to remove the protest replies. This type of responses are viewed as threats to the validity of benefit-cost analysis (BCA) to the extent that if a person states a zero amount in reaction to some unintended aspect of the measurement process, the response is considered either suspect or inappropriate. (Jorgensen .et.al. 1999)

The survey results showed why the people are not willing to pay any amount of money in addition to their current water bill if the water fee would be increased with a wastewater fee to operate the wastewater treatment plant.In Köyceğiz, 55.5 percent of the respondents replied to this question. 44.5 percent of them did not give any reason. In Dalyan, 37.7 percent of the respondents replied and 62.3 percent of the respondents did not explain the reasons for their decisions.

After a review of the replies , it was thought that the reasons stated below must be protest replies for both sites.

For Köyceğiz

-do not trust the services

-it's a public service that the Municipality should carry out

-it's for the public, it should be free

For Dalyan

-do not trust to the services

-it's a public service that the Municipality should carry out

-Supply from the credit agency, KfW

In Köyceğiz, 5.4 percent of the community opposed to paying any amount of money for the wastewater treatment project. They did not believe that the Authority would operate the plant in a proper way and thought that it was a service that should be supplied by the government free of charge.

In Dalyan, 7.3 percent of the people opposed to any payment. This was an expected result as during the survey, it became clear that the population of Dalyan was more

aggressive than that of Köyceğiz. There are no rigid limits for the range of the protest replies but in practice, these ranges (5.4 and 7.3 percent) are the accepted ranges for the CV Method.

After removal of the protest replies, the evaluation of the survey results was completed and they are summarized in the following part of this section.

In Köyceğiz during the survey, 56.3 percent of respondents did not have a connection to the sewerage system. This means that althought they had no connection to the system yet, a higher percent of the people accepted to pay WTP (Only 26.9 percent of respondents rejected to pay WTP). It was an indicator of trust in the service. In Dalyan 66.7 percent of the respondents were not connected to the sewerage system.This was a higher range compared with WTP payment.(14.9 percent of respondents rejected to pay WTP). During the survey, the Authority explained that they had completed more house connections in Köyceğiz than in Dalyan.

In Köyceğiz 30.4 percent of the respondents thought that the area was polluted. 33.4 percent of the respondents were not sure whether the area was clean or polluted. 26.1 percent of them believed that the area was clean.

The Dalyan people had almost the same feelings: 33.9 percent of them thought that the area was polluted; 34.7 percent of the respondents were not sure whether the area was clean or polluted. 17.3 percent of them thought that the area was clean. The high percentage of those who believed in the pollution of the area was due to the failure to complete the infrastructure facilities by the announced deadline. There were some problems with the contractor and during the very long period of time it took to complete the piping system the streets of the cities constituted an appalling sight. As a result, both communities pointed to city planning as a priority issue for the improvement of the region, with 44.7 percent and 22.3 percent, respectively of the Dalyan and Köyceğiz people choosing this alternative.

Tourism was the foremost improvement area for respondents from Köyceğiz with 34.2 percent, but the people of Dalyan gave it a the second place with 17.3 percent. Obviously the Köyceğiz people thought that tourism would increase their incomes, as they saw from the experience of Dalyan.

66.8 percent in Köyceğiz and 47.4 percent in Dalyan maintained that the most important characteristic of the area was natural beauty and tranquillity . The second important characteristic was mentioned as the lake for Köyceğiz and turtles for Dalyan.

For the question, “If the wastewater treatment plant is not operated, do you believe in the possibility that what is explained to you shall occur,” it was first explained to the respondents that existing pollution would increase rapidly parallel to the increase in population and this pollution would affect everybody directly or indirectly. The percentage of yes replies was extremely high for both towns: 92.7 percent of Köyceğiz and 91.3 percent for Dalyan.

In response to the question about how much the people knew about the situation before this interview, 56.1 percent of the respondents in Dalyan and 50.8 percent of those in Köyceğiz said that knew that it was at least as critical as they were informed. This means that over half of the people in both communities were aware of the situation.

93 percent of the Dalyan people and 88 percent of the Köyceğiz people approved the idea of paying an extra amount of money. When these results were compared with the WTP question, for both percentage ranges decreased as indicated below.

When the WTP question was evaluated in Köyceğiz, the results indicated that 26.9 percent of the respondents refused to pay WTP, while 69.3 percent accepted such payment.

In Dalyan, the results indicated that 14.9 percent of the respondents refused to pay WTP, versus 83.2 percent who accepted to pay. It is also meaningful that Dalyan people agreed that the treatment project as a must for the development of the area. They earned money from tourism and the clean environment is the main source for their income. However, Köyceğiz people had no big expectations from tourism. When their income range was compared (Appendix 2,3), it was clear that they were a middle class community and had no big expectations for future. For Dalyan, the results of the income question did not reflect the real situation, since they did not state their real incomes. This was a type of behaviour usually observed among populations in developing countries. In fact, the comparison of welfare figures of the two towns revealed substantial differences between them.

According to the survey results, 57.7 percent of the survey sample in Dalyan consisted of people in the 18 - 40 age group. 59.5 percent of the survey sample in Koycegiz were in the 30 - 50 age group. The distribution with respect to gender was 66.6 percent and 32.3 percent male and female for Köyceğiz, respectively. The distribution for Dalyan was 78 percent male and 21.7 percent female. For Köyceğiz, the questions pertaining to education revealed that 31.8 percent of the sample population had a high school education , 26.9 percent a university education, and

23.6 percent had only completed primary school education. For Dalyan, the figures were 33.3, 18.7 and 30.4 percent, respectively, high school, university and primary school education.

With respect to occupations, 42.6 percent of the Dalyan group was evenly distributed as being employed in hotel business, trade and tourism related work (bars, restaurants, etc.) In Koycegiz 55.5 percent of the group consisted of tradesmen, civil servants and retired persons. The majority of the Dalyan group (63.1 percent) was active in the tourism sector, whereas in Köyceğiz this constituted a minority with 16.3 percent.

In Dalyan, the reported income range did not reflect the real earnings. From the frequency distribution and cross-tabulation tables (Appendix 2, 3) , it seemed as if the two communities actually enjoyed equal welfare levels, but in reality during the survey it was observed that Dalyan people refrained from stating their true incomes.

4.1.2. Evaluation of the Cross Tabulations Of Responses

The next step in the analysis of the survey was to determine whether different groups of people in the sample gave different responses to the valuation questions. These analyses began to address to questions of who is willing to pay the most for the good or service and why.

Table 4.1 The Distribution of Yes and No Replies in the Two Towns Across the Bid Levels

	Dalyan					**Köyceğiz**			
Bid level	**Yes bidders**	**%**	**No bidders**	**%**	**Bid level**	**Yes bidders**	**%**	**No bidders**	**%**
30	41	97.6	1	2.4	30[1]	33	80.5	7	17.1
40	41	87.2	6	12.8	40[1]	25	53.2	21	44.7
50[1]	37	90.2	2	4.9	50[1]	32	72.7	10	22.7
60[1]	40	83.3	7	14.6	60	32	69.6	14	30.4
70	34	79.1	9	20.9	70[1]	35	81.4	7	16.3
80	42	82.4	9	17.6	80	31	67.4	15	32.6
90[1]	32	68.1	14	29.8	90[1]	36	70.6	12	23.5
100	40	85.1	7	14.9	100[1]	31	64.6	13	27.1
Total	307	83.9	55	15	**Total**	255	69.7	99	27

[1] The rest of the percentage was uncertain replies

As a result of the survey, yes replies to across the bid levels varied between 97.6 percent and 68.1percent in Dalyan, but between 81.4 to 53.2 percent in Köyceğiz. A comparison of the WTP question according to age groups showed that the highest yes replies were received from the 61 - 70 age group (79.2 percent) and the 51 - 60 age group (75 percent) in Köyceğiz. The situation in Dalyan showed that highest yes replies were received from the 51 - 60 age group (88.1 percent), followed by the 31 - 40 age group (86.4 percent). When the WTP replies were compared by education level, the results showed that 74.7 percent of the university educated people would be willing to pay in Köyceğiz. In Dalyan the results showed that 85.2 percent of high school educated people would be willing to pay . The comparison by income revealed that 100 percent of Dalyan would be willing to pay in income range less than 100 million TL and 600-700.million TL and 800-900 million TL . In Köyceğiz, begining of the lowest income range (less than 100 million TL) to 900-1 billion TL, yes responses of WTP question increased dramatically from 50 percent to 85 percent of Köyceğiz . It was interesting to note that the over 1 billion TL income interval had the lowest percentage of positeve responses in both towns. It was concluded that higher earnings brought a lower less acceptance of the WTP.

4.2. Data Manipulation procedures applied to the CV survey carried out in Dalyan and Köycegiz

4.2.1. Recoding of the data

Instead of their willingness to pay a specific money amount in a contingent valuation dichotomous choice format, the respondents were asked whether they were willing to pay a specific percentage over and above their current monthly water bill to operate the newly built wastewater treatment plant in their town. Respondents were first asked how much they paid monthly for water and then about their willingness to pay a specific percentage over and above this specific money amount.

In the pre-testing of the questionnaire, a substantial number of people appeared to have problems answering yes or no to a specific predetermined bid amount. When asking them alternatively for a percentage instead over and above their current water bill, this appeared to produce significantly less difficulties and was hence subsequently considered the best way to ask respondents the WTP question. Those respondents who were unable to state how much money they currently pay every month for their water bill were informed that the average water bill amounts 10 million TL. The percentage used in the survey (30,40,50,60,70,80,90 and 100%)

are based on the pre-test results and correspond to the suggestions from the municipality and wastewater treatment experts who were consulted during the designing of the questionnaire.

Consequently, a prefixed number of bid levels was not obtained - as is usually the case in contingent dichotomous choice surveys, but a large number of bid amounts (>50) when multiplying the percentage with the specific individually stated water bill amounts. But for the usage of the models in SPSS , it is a rule that definite numbers of bid have to be defined. Based on the frequency distribution of this continuum of bid amounts , the following 10 bid levels were identified:
1, 1.5, 2, 2.5, 3, 4, 5, 7.5, 10 and 20 million TL.
These bid amounts were next allocated to each individual respondent based on their yes or no reply and the product of the specific percentage and their water bill:

Bi = Bi-1 if WTP = yes

Bi = Bi+1 if WTP = no

Bi = Bi if Bi = 1, 1.5, 2, 2.5, 3, 4, 5, 7.5, 10 or 20 million TL, irrespective of WTP

where Bi is a specific bid level , Bi-1 the lower bound bid level and Bi+1 the higher bound bid level of the bid interval [Bi-1; Bi+1] in which Bi falls. So, for example, if a respondent said yes to an increase of 30 percent to his current water bill of for example 7 million TL (i.e. 2.1 million TL), then he is expected to be willing to pay also the next lowest bid of 2 million TL. On the other hand, if he said no to this, he is expected to say also no to the next highest bid of 2.5 million TL. In those cases where the product of the percentage and the current water bill equals one of the specified bid levels above, the bid level stays the same. For example, if someone said yes or no to an increase in his water bill of 30 percent and he currently pays 10 million TL, then the bid amount remains 3 million TL, irrespective of the respondent's reply to the WTP question.After going through the procedure outlined above[1], the distribution of yes and no replies in the both towns across the ten bid levels is summarized in the table 4.2 and the figure of the Cumulative Distribution Function of the both towns is shown in the figure 4.1.

[1]And excluding the identified protest bidder

Table 4.2 The Distribution of Yes and No Replies

	Dalyan					Koycegiz			
Bid level	**Yes bidders**	**%**	**No bidders**	**%**	**Bid level**	**Yes bidders**	**%**	**No bidders**	**%**
1	30	93.8	2	6.3	1	16	88.9	2	11.1
1.5	46	95.8	2	4.2	1.5	24	85.7	4	14.3
2	32	80.0	8	20.0	2	32	76.2	10	23.8
2.5	23	95.8	1	4.2	2.5	11	61.1	7	38.9
3	36	100.0	0	0.0	3	39	78.0	11	22.0
4	20	74.1	7	25.9	4	28	65.1	15	34.9
5	33	84.6	6	15.4	5	53	81.5	12	18.5
7.5	23	74.2	8	25.8	7.5	27	62.8	16	37.2
10	30	76.9	9	23.1	10	21	55.3	17	44.7
20	12	63.2	7	36.8	20	5	33.3	10	66.7
Total	285		50		Total	256		104	

After putting the table 4.2 in a graph, below figure was got as a result of the frequency distribution.

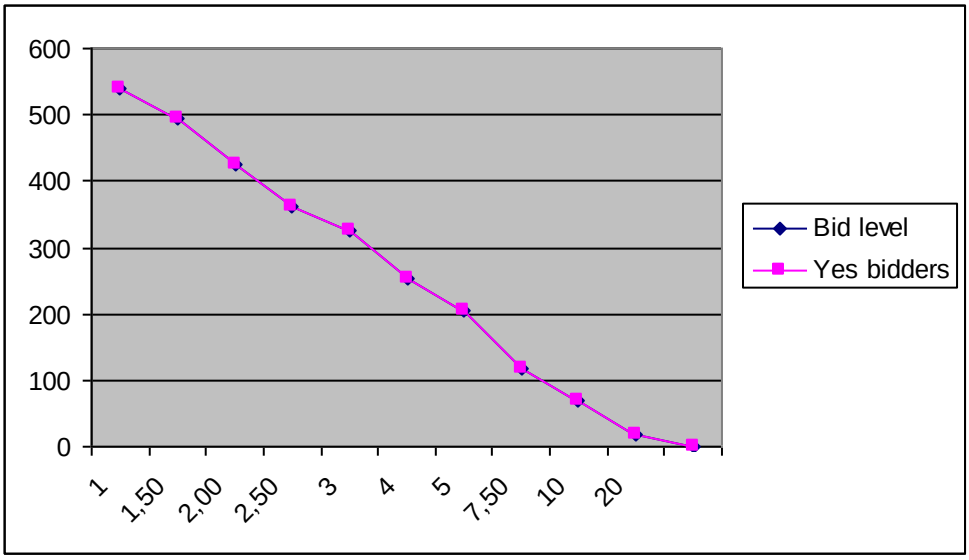

Figure 4.1. Cumulative Distribution Function of the Both Towns

4.2.2. Estimation of mean values in the two towns

The contingent dichotomous choice model does not reveal the maximum WTP amount, but is only a discrete indicator of maximum WTP. Mean and median WTP are inferred from the underlying statistical distribution of the probability that respondents say 'yes' or 'no' to different bid levels. This means that relatively large samples are needed to calculate the expected average WTP with the same accuracy as those methods that ask respondents directly for their WTP amount. Different mean WTP values can be calculated depending on the statistical specification of the valuation function and the truncation strategies used.

The estimation of the distribution of the WTP is tackled in the literature through parametric or non parametric approximations. The calculation procedures for mean and median values based on binary CV response data were first outlined by Hanemann (1984). Various statistical models exist to estimate these underlying distributions, *i.e.* parametric approaches such as logit or probit models or non-parametric approaches as the ones developed by Kriström (1990) and the Turnbull estimation procedure (Haab and McConnell, 1997). The parametric approximation, widely used in the CV analysis , specifies a parametric model in which a relation between the WTP and the consumer intrinsic characteristics is stated. The non parametric approximation estimates the distribution of the WTP without assuming any parametric specification of the preferences distribution. Both approximations have advantages and disadvantages. These models usually produce significantly different results and are an important source of producing statistical model specification bias in the analysis of CV results. In this study a (parametric) logistic probability model is used to estimate mean and median WTP and the (non-parametric) Turnbull model.

The logistic probability or logit model is a model for binary outcomes such as yes or no. Estimation of a logit model with a dependent variable with a value of 1 if the offer(bid) was accepted and 0 if it was not. The explanatory variables include the value of the bid and socio-economic characteristics of households.The model allows estimation of the probability that individual respondents say for example 'yes' or 'no' to a prespecified question as a function of one or more explanatory factors (Langford,1993). .

The reduced form of the model is:

$$\Pr ob[y_{i=1}] = \frac{e^{\beta' x}}{1 + e^{\beta' x}} \qquad (4.1)$$

where Prob[y_i=1] is the probability that a respondent says 'yes' to a specific bid amount. Beta (β) is a vector of variable parameters to be estimated, while x is the corresponding vector of explanatory variables. The error terms of the logit model are assumed to be normal distributed with zero mean and variance of one.

An important problem when using referendum type of models (like dichotomous choice) is the possibility of negative WTP (*e.g.* Hanemann, 1989; Johansson *et al*., 1989). The distribution of WTP also has a negative tail, unless the CPDF(Cumulative Probability Distribution Function) is truncated so as to include positive bids only or bids are transformed into their logarithmic form. However, also in these cases, the problem persists.

Although usually not part of the range of bid levels used in DC models, negative bids may be present when respondents feel they should be compensated for a specific environmental change. Willingness to accept compensation (WTAC) instead of WTP would in this case be a more appropriate question (Hanemann, 1991). However, in those cases where WTP is considered the most appropriate question (by respondents), negative WTP is neither expected nor plausible. In the literature, the non-parametric Turnbull estimator has been proposed as an alternative solution to the parametric models discussed above (Haab and McConnell, 1997).

The Turnbull estimator is based on a grouping of binary responses in bid intervals. In this sense, the approach is very similar to the non-parametric approach proposed by Kriström (1990). In order to guarantee non-negative outcomes for WTP, the probability of WTP responses are constrained to be positive and sum to unity across bid intervals. Furthermore, a monotonically increasing CPDF is guaranteed by pooling intervals where needed. A description of the procedure is given by Haab and McConnell (1997). Like the approach proposed by Kriström (1990), the Turnbull estimator can be calculated manually. An important advantage of the Turnbull

estimator compared to the approach by Kriström is the ease of computing standard errors.

Mean WTP can be calculated as the sum of the probabilities of respondent voting behaviour times the various bid levels used. Another attractive feature of the approach, recognised for instance by Carson *et al*. (1994), is the use of the lower bound of each interval in order to estimate a conservative lower bound WTP:

$$E(WTP) = \sum_{i=1}^{m+1} P_i * B_{i-1} \qquad (4.2)$$

where P_i is the probability of respondents voting no in the bid interval $[B_{i-1}, B_i]$,the lower bound bid level, and m the maximum bid. The probability of respondent voting behaviour in the constructed intervals (P_i) is calculated as the difference between the proportion of respondent voting behaviour across the two bid levels B_{i-1} and B_i:

$$P_i = N_i - N_{i-1} = \frac{n_i}{n_i + y_i} - \frac{n_{i-1}}{n_{i-1} + y_{i-1}} \qquad (4.3)$$

where n_i is the number of no votes to bid level B_i and y_i the number of yes votes to bid level B_i.

The standard error (s) of the lower bound mean WTP is given by:

$$s = \sqrt{Var(E(WTP))} = \sqrt{\sum_{i=1}^{m+1} Var(P_i) - 2\sum_{i=1}^{m} Var(N_i) B_i B_{i-1}} \qquad (4.4)$$

The lower bound estimate can be applied if the probabilities of voting behaviour in constructed intervals are based on no votes. An upper bound can also be determined if all respondents offered the largest bid amount respond no and hence the upper bound takes on a finite value (Haab and McConnell, 1997).

Finally, in the case of dichotomous choice models usually conventionally calculated (*i.e.* assuming normal distribution) confidence intervals are used. However, small numbers of observation per bid level, as we have in this case study, quickly make the assumption of normal distributed random parameters unlikely. Bootstrap procedures are one way to produce more accurate inferences regarding confidence intervals on the basis of simulated parameter estimates when numbers of observation are relatively small (Efron and Tibshirani, 1993) and have also been used here.

4.2.3. Empirical results of the Mean WTP

The mean is the conventional measure in benefit cost analysis ; the median may be more realistic in a world where decisions are based on voting . From a statistical point of view, the mean is generally far more sensitive than the median to the choice of a response probability model or the method of estimation.(Hanemann and Kanninen,1998) .

The (linear) logistic regression and Turnbull estimation results are presented for the two towns separately below (Table 4.3)[2]. From the table, two things become immediately apparent. First, the large differences between the mean WTP values calculated from the (parametric) logistic approach and the (non-parametric) Turnbull approach, and secondly the large (relative) differences in standard errors and hence the inaccuracy (and unreliability) of the logistic probability model estimates.

The mean (and median)[3] values derived from logistic regression are significantly different in the two towns when applying the Normal test to test the null-hypothesis of equality. The mean values based on the Turnbull estimation are not significantly different as the Normal test statistic is unable to reject the null hypothesis of equal WTP values[4].

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[2] The logistic regression results were obtained using the statistical software package SPSS, while the Turnbull estimation and bootstrap procedure was carried out using Stata.(it is a professional statistical software program)

[3] Mean and median values are the same in the linear-logistic probability model as a result of the symmetric underlying distribution function.

[4] Normal test:

$W\hat{T}P_i - W\hat{T}P_j \pm z_{0.025}\sqrt{\frac{s_i^2}{n_i} + \frac{s_j^2}{n_j}}$, where z is the standardised normal variable (N(0,1) distributed underH_0) and the subscripts i and j refer to the two different towns (Dalyan and Koycegiz).

Table 4.3 The (linear) Logistic Regression and Turnbull Estimation Results

	Dalyan	**Köyceğiz**
Logistic probability model		
Prob (yes=1)	2.351 – 0.011 * Bidlevel (0.238) (0.003)	1.548 – 0.012 * Bidlevel (0.199) (0.003)
Mean WTP [1] (million TL/household/month)	21.4	12.9
Standard error [2]	7.6	4.7
95% confidence interval [3]	6.5 – 36.3	3.8 - 22.0
N	335	360
Turnbull model		
Mean WTP [4] (million TL/household/month)	3.5	3.5
Standard error [5]	0.3	0.2
95% confidence interval [3]	3.0 – 4.0	3.1 – 3.9
N	335	360

[1] The formula to calculate mean and median WTP based on linear-logistic regression is:
E(WTP) = -a/b, where a is the estimated constant and b the estimated slope for the bid level.

[2] The standard error of mean WTP is calculated as follows:

$$s = \sqrt{\mathrm{var}(-a/b)} = \left[\frac{1}{b^2}\left(\mathrm{var}(a) + \left(\frac{a}{b}\right)^2 \mathrm{var}(b) - 2\left(\frac{a}{b}\right)\mathrm{cov}(a,b)\right)\right]^{1/2}$$

where a is again the estimated constant (intercept) and b the slope of the bidlevel.

[3] Based on the conventional calculation of the 95% confidence interval:

$E(WTP) \pm 1.96\sqrt{\mathrm{var}(E(WTP))}$.

[4] Turnbull estimate. See formula (2).

[5] Standard error calculated based on bootstrapping procedures because of the low number of observations per bid level .

4.2.4. Results of the Multivariate regression

Qualitative variables, such as gender and marital status, always represent valuable information for the modelling process. However, most modelling techniques can not directly accept the contextual values (e.g. male or female; married or single) of qualitative variables. Dummy variable coding is the method used to transform qualitative variables into numerical “dummy” variables ready for the modelling process.

The results of the multivariate linear logistic model are presented in the table 4.4. below. The datasets of the two towns are pooled into one data set in order to increase the total number of observations in the estimation procedure. A dummy variable for the place where the interview took place is included in the model in order to be able to distinguish between data sets.

Only the statistically significant results at $p<0.10$ are shown, i.e. a significance level of at least 10 percent. Two different pooled models were estimated, one including the current water bill as an explanatory factor (Model 1) and one excluding the current water bill as an explanatory factor (Model 2). The outputs of the models are found in appendix 5. Both models explain the probability that a respondent says 'yes' to the willingness pay question. The inclusion of the current water bill as an explanatory factor influences the significance level of other explanatory factors, hence the reason why two different models are presented here. Corresponding to previous findings in the literature (e.g. Brouwer et al., 1999; Bateman et al., 2004), there is not only significant anchoring of willingness to pay on the bid levels, but also on the current price paid for the specific good in question (i.e. water).

Table 4.4 The Results of the Multivariate Linear Logistic Model

		Model 1	**Model 2**
Explanatory factor	**Value range**	**Parameter estimate**	**Parameter estimate**
Constant	-	0.647 (0.485)[1]	0.956** (0.427)
Bid level	1-20 million TL	-0.040*** (0.006)	-0.012*** (0.002)
Interview place	0=Dalyan; 1=Koycegiz	-1.217*** (0.246)	-1.080*** (0.216)
Net monthly income level	1: <100 million TL – 11:>1 billion TL	0.121*** (0.043)	0.126*** (0.037)
Believe in baseline scenario?	Dummy (1=yes)	0.827** (0.368)	0.978*** (0.349)
Current water bill	0.4 – 275 million TL	0.021*** (0.005)	-
Recreation intensity in the area	0=never – 2=very often	0.377** (0.188)	-
Connected to the sewer system?	Dummy (1=yes)	-	0.427** (0.222)
Respondent decision-maker in household?	Dummy (1=yes)	-	-0.345* (0.202)
-2 Log-likelihood		489.3	613.1
χ^2		112.1 (6df[2];p<0,01)	75.4 (6df;p<0,01)
Correctly predicted	%	82.9	78.2
R^2		0.27[3]	0.17
n		590	633

[1] Standard errors of the parameter estimates between brackets.
[2] df=degrees of freedom
[3] R^2 is explanatory power of the models
***: p<0.01; **: p.05; *: p<0.10

In Table 4.4, it was shown that the linear logistic regression results where the response (dependent) variable is the probability that the respondent says 'yes' to the willingness to pay question.

Both models are statistically significant, as can be read from the Chi-square statistic. The null hypothesis that all parameter estimates are zero is convincingly rejected

with this test statistic at the 1 percent significance level. The explanatory power of both models (measured through R-square) is in the range usually found in the literature. One important reason for the relatively low explanatory power of contingent valuation models is related to the cross-section nature of the collected data. The overall predictive power of the models is reasonable, ranging between 78 to 83 percent. This means that the estimated models are able to correctly predict a yes or no answer to the willingness to pay question in approximately 80 percent of the cases included in the analysis.

The number of observations used in the models is lower than the original number of observations (n=787; n=398 for Dalyan and n=389 for Köyceğiz) as a result of missing values for one or more of the explanatory variables. The statistical package used (SPSS 10.0) automatically deletes observations which include missing variables. The number of observations in Model 1 is not equal to the number of observations in Model 2 because these models include slightly different explanatory variables with different missing values. Obviously, the higher the number of observations, the more reliable the statistical outcomes. However, the difference in the total number of observations between the two models is not very high (Model 2 is based on less than 10 percent more observations than Model 1).

The two models do not differ very much in terms of their explanatory factors. Four of the six factors are common in both models: bid level, the place where the interview took place, household income and respondents belief in the presented baseline scenario. All the explanatory factors have the a priori expected sign. As always, bid level has a negative impact on the probability that someone says yes to the willingness to pay question. The higher the bid level, the lower the probability of saying yes. Another important indicator for the validity of the estimated model is the significant positive impact of respondent household income on willingness to pay. As predicted by economic theory, willingness to pay is constrained by income. In this case, this means that the lower someone's disposable (net) household income, the lower the probability that he or she answers positively to the willingness to pay question and vice versa.

The place of respondent residence significantly influences stated willingness to pay. Corresponding to the results found for mean and median willingness to pay based on the univariate linear logistic model, the probability that Köyceğiz residents say 'yes' to the willingness to pay question is also *caeteris paribus* significantly lower than the probability that Dalyan residents do so.

That is, whilst controlling not only for bid level, but also other explanatory factors such as household income or the respondent's belief in the presented baseline scenario, Dalyan residents are more likely to say 'yes' to the willingness to pay question (or a specific bid level) than Köyceğiz residents.

An interesting finding is that the respondent's belief in the baseline scenario also appears to have a significant positive effect on the stated willingness to pay. Respondents were presented a scenario which described what would happen if the waste water treatment plant did not become operational in the next years - the so-called baseline scenario (corresponding to a '*do nothing*' scenario). Respondents who believe in the baseline scenario of further environmental quality deterioration are more likely to say yes to the willingness to pay question than respondents who do not believe this scenario. This finding neatly complements the findings in recent research Powe and Bateman (2004) looking at respondent perception of the feasibility of the presented valuation scenario. This research shows that the respondent's belief is both a significant determinant of the stated willingness to pay and a substantial contributor to the explanatory power of contingent valuation models.

As said, significant positive anchoring occurs when the respondent's current water bill is included in the model (Model 1). The inclusion of this explanatory factor influences the significance level of other explanatory factors. Whether or not someone is connected to the sewer system is, as expected, significant and positive in Model 2, but not in Model 1. Obviously, one would expect those already connected to the sewer system to be more likely to be willing to pay extra for a fully operational wastewater treatment plant than those who are not (and have a septic tank, for instance).

How often someone has a recreational activity in the area has a positive effect on the probability of saying yes to the willingness to pay question in Model 1, but not in Model 2. The more someone recreates in the area, the more likely he or she is willing to pay. Whether or not someone considers him/herself the head of a household, making relevant financial decisions, significantly affects the stated willingness to pay in Model 2. Respondents who indicate that others in their household take such decisions are more likely to say 'yes' to the willingness to pay question than those who consider themselves the head of a household. This too is a very interesting finding in contingent valuation research, not often investigated or included in the survey set-up. In Turkey, especially rural Turkey, the family and

household structure is an important factor, manifesting itself also in this specific contingent valuation study.

Other factors investigated, but which appeared to have no significant effect (at $p<0.10$) on stated willingness to pay in Model 1 or Model 2 include the respondents' demographic and socio-economic conditions such as age, gender, education level, household size, whether or not a respondent has children (and how many), whether someone is dependent on the tourist sector for his income or whether someone owns a house. Also not statistically significant are factors such as whether the respondent had an artesian well or a septic tank, if she ever had problems with her septic tank, her perception of the degree to which the area is polluted, her a priori expectations of the level of pollution compared to the description given in the questionnaire, specific recreational activities she might undertake in the area, or the various possible benefits (clean drinking water, recreational opportunities etc.) derived from an improvement of the environmental quality of the area.

4.3. Estimates of Economic Benefits Based on the Contingent Valuation Survey: Is this project economically beneficial?

Household level benefits were measured using a direct questioning approach. This is a form of contingent valuation where respondents are asked to accept or reject an infrastructure project offered at a specified cost per household.(Hoehn and Krieger, 1996)

The total net benefits of the project were computed using a present value formulation since they were based on infrastructure and equipment items with a long useful life. The present value approach provided a consistent method for adding up benefits across all the households affected within a given time period and across the useful life of the capital investment and yearly operational and maintenance costs.

The decision of investment or operation of the system requires a comparison of NPV, net present value of the costs. If the Net Present Value of benefit exceeds the cost price (NPV > 0) then the investment or operation of the system is worthwhile. (Pineda,1999)

In this study, the mean Willingness to pay was estimated at 3.500.000.TL/ household-month (2.45 euro) as a result of Turnbull estimation for both towns from the survey and this was multiplied by 12 months-in-year and 3500 households to obtain an annual willingness to pay for improved water quality for each town was estimated at € 102.876 per year.Because of the plants were completed and just

started to operation, it was accepted that the investment costs are the sunk[1] and not adding to Benefit Cost evaluation.

The next step is to calculate the present value (PV) of benefits from the operation of the wastewater treatment plant, assuming a 30 year time horizon for the project. The main findings is that the stream of benefits generated by this project are estimated at approximately € 2.210.000 over a 30 year time horizon,(3 percent discount rate) compared to the costs to households of € 2.160.000 for the operation of the wastewater treatment plant for each town.
It is recommended that as the discount rate of 3 or 5 percent for water projects in Turkey. So these values are used and results are shown at table 4.5.

Table 4.5 Present value of Benefits for range of Discount Range

Discount rate	**Present value**	**Benefit-Cost Ratio**
3 percent	€ 2.210.519	1.02
4 percent	€ 1.920.141	1.02
5 percent	€ 1.684.512	1.02

Benefit cost ratio of three different discount rates is almost equal to 1 for both towns. From an economic point of view, there is a break-even point[2] for the operation of the WWTP, i.e. costs equal benefits over the time period considered. However, in the CBA, because of the time and cost limitation , only benefits generated by the local community was estimated but the important other benefit such as positive effects on tourism and the additional income this sector may generate as a result of improved water quality were not considered . If the time and cost were available, we would estimate extra benefits for tourism and add to above benefit amounts . As a result of this acception, Benefit cost ratio would be higher than 1.

As the mentioned before, the mean WTP was estimated by the two diffferent models. Above calculations are based on the mean WTP found by the Turnbull model. If the mean WTP estimated by the parametric model was taken into account in the benefit cost analysis, BC ratio which was found that equal to 1 would be higher than 3.5.

[1]Sunk cost means that already incurred which can not be recovered regardless of future events

[2]The break-even point is defined as the point where sales or revenues equal expenses. There is no profit made or loss incurred at the break-even point.

5. CONCLUSION AND RECOMMENDATIONS

The path to sustainable development implies the consistent use of economic tools for the evaluation of projects, programmes and policies which are either designed to protect the environment or are likely to have an environmental or likely to have an environmental impact. Over the last 10 years or so, the field of environmental economics has evolved considerably, in particular in the area of economic techniques for the valuation of environmental impacts, the pricing of natural resources and the choice of appropriate economic instruments of environmental policy. The OECD Environment Directorate has been closely involved in the development of these methods in OECD Member countries. Despite the evident need for more economic rationality in environmental policy, studies have clearly indicated that these economic techniques are still not widely used in practice. Furthermore, it is clear that an economic evaluation of project, programmes and policies is crucial in developing countries to achieve sustainable development.

Since the CVM is the only practical means of estimating the environmental benefits, this method was applied in Köyceğiz-Dalyan Area. Mostly, if policy makers want to know people's existence values for a natural area, the CVM is the only available benefit estimation procedure.

The majority of applications of all of the Valuation Techniques have been carried out in the US and Canada, followed by Europe. Not surprisingly, the fewest applications have been done in developing countries. However, interest in valuation work in developing countries is growing rapidly.

Different valuation techniques may measure different things. They should be considered complimentary, not competing tools. For example, CV Method is the only available technique for measuring nonuse values. Suppose that estimates of use value of a national park and wildlife reserve were obtained using a travel cost model and estimates of nonuse value were obtained from a CV

survey.These value estimates are not substitutes for one another; both are useful for policy makers.

The estimation of the Distribution of the WTP is tackled in the literature through parametric or non parametric approximations. Various statistical models exist to estimate these underlying distributions, *i.e.* parametric approaches such as logit or probit models or non-parametric approaches as the ones developed by Kriström (1990) and the Turnbull estimation procedure (Haab and McConnell, 1997). The parametric approximation, widely used in the CV analysis , specifies a parametric model in which a relation between the WTP and the consumer intrinsic characteristics is stated. The non parametric approximation estimates the distribution of the WTP without assuming any parametric specification of the preferences distribution. Both approximations have advantages and disadvantages. These models usually produce significantly different results and are an important source of producing statistical model specification bias in the analysis of CV results. In this study a (parametric) logistic probability model is used to estimate mean and median WTP and the (non-parametric) Turnbull model.

The logistic probability or logit model is a model for binary outcomes such as yes or no. Estimation of a logit model with a dependent variable with a value of 1 if the offer(bid) was accepted and 0 if it was not. The explanatory variables include the value of the bid and socio-economic characteristics of households.The model allows estimation of the probability that individual respondents say for example ‘yes’ or ‘no’ to a prespecified question as a function of one or more explanatory factors.

The Turnbull estimator is based on a grouping of binary responses in bid intervals. In this sense, the approach is very similar to the non-parametric approach proposed by Kriström (1990). In order to guarantee non-negative outcomes for WTP, the probability of WTP responses are constrained to be positive and sum to unity across bid intervals.

The mean is the conventional measure in benefit cost analysis ; the median may be more realistic in a world where decisions are based on voting . From a statistical point of view, the mean is generally for more sensitive than the median to the choice of a response probability model or the method of estimation.

The (linear) logistic regression and Turnbull estimations are used for the two towns. From the results, two things become immediately apparent. First, the

large differences between the mean WTP values calculated from the (parametric) logistic approach and the (non-parametric) Turnbull approach, and secondly the large (relative) differences in standard errors and hence the inaccuracy (and unreliability) of the logistic probability model estimates. The mean values derived from logistic regression are significantly different in the two towns but the mean values based on the Turnbull estimation are not significantly different.

Both models are found statistically significant. The explanatory power of both models is in the range usually found in the literature. One important reason for the relatively low explanatory power of contingent valuation models is related to the cross-section nature of the collected data. The overall predictive power of the models is reasonable. This means that the estimated models are able to correctly predict a yes or no answer to the willingness to pay question in approximately 80 percent of the cases included in the analysis.

This research shows that respondent believe is both a significant determinant of stated willingness to pay and substantial contributor to the explanatory power of contingent valuation models.

The two towns have a significant effect on stated WTP, corresponding with the findings of mean and median WTP which the calculated before. The results are more or less theoretically expected. This wil strengthen our case and it means that the model complies with theory.

The mean Willingness to pay was estimated at € 2. 45 per month-household for both towns from the survey and this was multiplied by 12 months-in-year and 3500 households to obtain an annual willingness to pay for improved water quality for each town was estimated at € 102.876 per year.

The next step is to calculate the present value (PV) of benefits from the wastewater treatment plant, assuming a 30 year time horizon for the project. The main findings is that the stream of benefits generated by this project are estimated at approximately € 2.210.000 over a 30 year time horizon,(3 percent discount rate) compared to the costs to households of € 2.160.000 for the operation of the wastewater treatment plant for each town.

Benefit cost ratio is almost equal to 1 for both towns. From an economic point of view, there is a break-even point for the operation of the WWTP, i.e. costs equal benefits over the time period considered. However, in the CBA, because of the time and cost limitation , only benefits generated by the local community was

estimated but the important other benefit such as positive effects on tourism and the additional income this sector may generate as a result of improved water quality were not considered . If the time and cost were available, we would estimate extra benefits for tourism and add to above benefit amounts . As a result of this acception, Benefit cost ratio will be higher than 1.

In Turkey, as in many development economies, the measure of the potential economic benefits of water and wastewater services can serve as a guide for development assistance for those low income or subsistence communities that do not generate enough money to implement such a project themselves. The estimated economic benefits using the CVM methodology can be great value as a way of improving the allocation of development assistance.

It is believed that this study can provide policy relevant informations for evaluating the financial feasibility of water sector investments in Turkey.

We were able to collect very important informations on communities' opinion about the water investment projects. As a result of this research, it is found that respondent believe is both a significant determinant of stated willingness to pay and substantial contributor to the explanatory power of contingent valuation models. This can be one of the main findings for new CV applications in Turkey.

It is important to develop a comprehensive framework to help understand how survey participants respond to CV question and the information available to them. Only by learning more about how respondents actually respond to various types of WTP questions will be able to improve our ability to model responses to those questions. These mean that before starting CV application, the pre-test is so important and must be considered very carefully.

For further research, academics and policy markets need more information about on non market values in order to entrance fully them into economic theory. Researchers know very little how they perform. In addition, it may be useful to review previous studies in order to determine their behaviour over time and the role of current events .

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APPENDIX A QUESTIONNAIRE

ISTANBUL TEKNİK ÜNİVERSİTESİ **Q NUMBER** | | | | | |

WATER QUALITY RESEARCH JUNE 2002

QUESTIONS TO HOUSEHOLD

First , I would like to introduce myself. I'm a student in Istanbul Technical University. We're doing a research project on this area.. With your permission, I've some questions that I would like to ask you. Your answers are very important and valuable for us.

Q.1. Do you have an artesian well?

Yes = 1 (GO TO Q2)
No = 0 (GO TO Q3)

Q.2. Do you use water from your well as potable water?

Yes=1 No=0

Q.3. Do you have a connection to the sewerage system?

Yes = 1
No = 0
Don't know/ not sure = 2

Q.4. Have you got a septic tank in which the waste water is collected?

Yes =1 No=0 (did you have before?)

Q.5. Did you ever experience a problem with your septic tank, especially after heavy rain or you could not have it emptied with septic truck?

Yes = 1
No = 0
Don't know /not sure = 2

Q.6. How often do you have a recreational activity in the area? (picnicking , swimming etc.)

Never = 0
Very Often = 1
Not very often = 2

Q.7. If you have recreational activities, when is the most preferred time?

1 Only summer
2 No specific season/ every year

Q.8. Which recreational activities do you involve in?

0 no
1 yes

8. Swimming
8.a Fishing
8.b Sailing/motor boating
8.c Surfing
8.d Hiking
8.e Others_____

Q.9. What is your opinion about the pollution in the area?

Very polluted = 0
Polluted = 1
Neither polluted nor clean = 2
Clean = 3

Very clean = 4

Q.10. In your opinion in which areas should this region be improvement?

Q.11. What is the most important characteristic that describes this city?

I would like to explain the problems the septic tanks I mentioned above may cause in time. The wastewater in the septic tanks diffuse into the soil and by time reach the lake. This factor leads to the present appearance of the lake and is the reason why you cannot swim in it. As you may know, a treatment plant is built to collect and treat the wastewater generated in houses. Not all the connections to the plant have been completed but will be completed soon.

As long as this plant is operated, it will treat the wastewater. However, if it is not operated, existing pollution will increase rapidly together with the increasing population and this pollution will affect everybody directly or indirectly. As you may have heard, we have had some similar situations in the golden horn (HALİÇ) in İstanbul and in the İzmir Gulf. The people who made their living in their jobs in these areas experienced great losses and many people living in the environment had to move from their houses. However, after the drastic measures taken in time, the area slowly transformed into a habitable region and people are now happier.

Here , everybody benefits from the lake in some way. If you have a plant in this environment, you will eventually have to stop operation...You will not even want to walk on the shores of this lake because of the odor and appearance. If you earn your life from fishing, your income will diminish because of the decrease or even extinction of many species of fishes in the lake.

(In this question, you should explain and convince the interviewer that he should be affected from the pollution. For this purpose, his or her occupation is very important. If nothing fits this situation, then stress the fact that in the near future they will not be able to sit and drink a cup of tea, near the lake.)

Under the light of these conditions, if the required measures are not taken and the wastewater treatment plant is not operated;

- Water quality of the lake would get worse and leave aside the fact that you cannot swim in it, you will not even be able to sail on the lake because of the bad view and odor. You could no longer walk along the shores of the lake... You will have to forget sitting at the banks of the lake and drinking tea.

- Since the groundwater and well water are polluted from wastewater diffusing from the septic tanks, you would not longer benefit from these resources.

Try to visualize the situation I have explained to you. In fact, I'll show you some photographs taken from the lake, as a living example to what I am trying to explain to you.

Q.12. If the wastewater treatment plant is not operated, do you believe in the possibility that what is explained to you shall occur?

yes = 1
No = 0 Why?
Don't know /not sure = 2

The solution to this is the operation of the wastewater treatment plant. This would bring to you three benefits mainly...

- You would be able to swim in lake in the future. Now we know that right now it is not possible to swim in the lake. However, when the plant commences its operation, wastewater will not diffuse into the lake, and after some time, the lake will be as it was in the past. You'll swim in the lake
- Since the water quality shall improve, it will become harmless to have contact with water and you will be able to sail on the lake and organize recreational activities. This will attract more tourists for sportive activities.
- Groundwater and well water would be reusable. You would be have potable ground water and well water.

Q.13. In comparison to what you knew before this interview, would you say that

You believed that the situation was less important than what is told to you.

2 *You believed that the situation was much less important that what is told to you*

3 You knew that the situation was at least as critical as it is told to you

4 You knew that the situation was important

5 You knew that the situation was critically important

6 don't know

Q.14. Which one of the following benefits of the wastewater system is the most important for you?
(read only 1-3 mark 4 if respondent insists)

1. Suitable for swimming
2. Suitable for human contacts
3. Using well water as the tap water
4. All are equally important
5. Others_____
6. Don't know/not sure

Q.15. Do you know that how much the septic tank costs to you per month? (If he says that he doesn't pay any money, we ask to him; why? Is it infiltrating or is it that they don't have any septic tank)

1 Yes

No

2 Infiltrating

3 don't have

(if he doesn't remember, he should give an average value.....TL/month

a) 0 (0-5 million TL)
1 (5-10 million TL)
2(10-15 million TL)
3 (15 million TL and more)

Q.16. As mentioned earlier, a monthly operation fee would have to be paid for the operation of this plant. Union of the Municipalities will collect your wastewater from your house then carry with pipes and treat in the plant. For this treatment, they shall consume power, man power and chemicals.

Please taking into contribution to you related with my explanation above, do you approve to pay extra money to your current water bill?

No = 0 (GO TO Q19)
Yes = 1 (GO TO Q17)
Don' know/not sure = 2

Now while answering the following questions keep in mind that you already pay for the other public services. Also remember that if you pay a monthly sewage charge you will have to reduce your monthly disposable household income payment .

Q.17. How much do you currently pay for your monthly water bill?

Q.18. Are you willing to pay ..... amount of TL in addition to your current water bill if the water fee would be increased with a wastewater fee to operate the waste water treatment plant?

If necessary repeat the whole question

Yes = 1 (go to O20)
No = 0 (go to Q19)

Don't know/not sure = 2

Q.19. Why? Please indicate the reasons?

Q.20. If the pollution rate in lake increases to a level higher than today, do you think that the people who are affected should receive compensation for their losses?

0 No
1 Yes
2 Don't know

Personel Questions (for Household)

In this section of the survey, we would appreciate if you could answer some questions for statistical purposes to help us compare your answers with those of other respondents. We note again that your answers will be evaluated together with those of the others and your name will remain anonymous and not appear on the questionnaire.

Q.1 Location of your residence:

1 Gelişim
2 Gülpınar
3 Ulucami
4 Yeni Mahalle
5 Maraş
6 Osmanağalar
7 Çavuşlar
8 Merkez
9 Sulungur
10 Arıkbaşı
11 Metinler
12 Marmara/Marmarlı
13 Çarşı içi
14 Atatürk bulvarı

Q.2 How old are you?

1 18-30
2 31-40
3 41-50

4 51-60

5 61-70

6 more than 70

Q.3. Gender:

1 Male

2 Female

Q.4. What is your education level

1 primary school

2 secondary school

High school

Univerity

other _____

Q.5. Marital status:

1 single

2 married

3 seperated or widowed

Q.6 Do you have any children?

Yes = 1 No = 0

Q.7. How many of your children live with you ?

0) 0

1) 1

2) 2

3) 3

4) 4

7a children (younger than 18)_____

7b Adult _____

7c Total _____

Q.8. What is your occupation ?

1 Hotel
2 Agricultural worker
3 Farmer
4 Fisherman
5 Tradesman
6 Owner of the Boat
7 Civil servant
8 Doctor, Engineer, lawyer etc.
9 Skilled worker
10 Unskilled worker
11 other

Q.9 Do you work in the tourism sector (hotels, restaurants, guide tours, tour operator) or are you depending for your work on the tourism sector in some way?

Yes = 1 (GO TO Q 10)

No = 0 (GO TO Q 11)

Don't know/not sure (GO TO Q 11)

Q.10 For how long have you been working in the tourism sector?

----- year / month

1) 0-5 years
2) 5-10 years
3) 10-15 years
4) 15 years and more

Q.11. Could you tell your monthly household income ? (NET)

i. *less than 100 million TL*

ii. *100 – 200 Million TL*

iii. *200 – 300 Million TL*

iv. *300 – 400 Million TL*

v. *400 – 500 Million TL*

vi. *500 – 600 Million TL*

vii. *600 – 700 Million TL*

viii. *700 – 800 Million TL*

ix. *800 – 900 Million TL*

x. *900 Million TL- 1 Billion TL*

xi. *More than 1 Billion TL*

Q.12 Who says the final word in your house when it's necessary to make decision economical or family issues?

You = 1
Another one =
Father=
3 Mother
4 Others _together _____

Q.13 Where do you live?

1 rented house (detached ? apt floor?)
2 Own house
3 In the house of the family

4 Any accommodation supplied by the employer

5 Others _____

Q.14 Do you or your family owns;

1 a house

2 an agricultural land

3 a car

4 a boat

5 Others_____

Q.15 Membership to a society or organization? (natural life, environmental, rotary...)

Q.16 If you have any additional comments that you wish to make on the questions asked, please write below;

_____

_____

Q.17 After I discuss your responses with My Professor, it might appear that I may have to ask a few more questions. If I need to call you, would it disturb you? I would appreciate it if you could give me your phone number. Your answers will be confidential and you should be sure that nobody else can see them..

Phone no:

Name

We appreciate your cooperation

Thank you !

All tables in Appendix B,C,D and E are the original outputs from SPSS Program

APPENDIX B Results of the Frequency Distributions from SPSS Program of Dalyan Survey

Table B.1 Do you have an artesian well?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	194	52,6	52,6	52,6
	yes	175	47,4	47,4	100,0
	Total	369	100,0	100,0	

Table B.2 Do you use water from your well as potable water?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	154	41,7	89,0	89,0
	yes	19	5,1	11,0	100,0
	Total	173	46,9	100,0	
Missing	System	196	53,1		
Total		369	100,0		

Table B.3 Connection to the sewerage system?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	246	66,7	72,1	72,1
	yes	93	25,2	27,3	99,4
	don't know/not sure	2	,5	,6	100,0
	Total	341	92,4	100,0	
Missing	System	28	7,6		
Total		369	100,0		

Table B.4 Have a septic tank?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	94	25,5	25,9	25,9
	yes	269	72,9	74,1	100,0
	Total	363	98,4	100,0	
Missing	System	6	1,6		
Total		369	100,0		

Table B.5 A problem with your septic tank?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	245	66,4	66,9	66,9
	yes	115	31,2	31,4	98,4
	don't know/not sure	6	1,6	1,6	100,0
	Total	366	99,2	100,0	
Missing	System	3	,8		
Total		369	100,0		

Table B.6 How often do you have a recreational activities?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	never	45	12,2	13,3	13,3
	very often	101	27,4	29,9	43,2
	not very often	192	52,0	56,8	100,0
	Total	338	91,6	100,0	
Missing	System	31	8,4		
Total		369	100,0		

Table B.7 Prefered time for recreational activities?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	only summer	71	19,2	25,2	25,2
	not specific season/every year	211	57,2	74,8	100,0
	Total	282	76,4	100,0	
Missing	System	87	23,6		
Total		369	100,0		

Table B.8 Swimming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	125	33,9	42,1	42,1
	yes	172	46,6	57,9	100,0
	Total	297	80,5	100,0	
Missing	System	72	19,5		
Total		369	100,0		

Table B.9 Fishing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	183	49,6	61,4	61,4
	yes	115	31,2	38,6	100,0
	Total	298	80,8	100,0	
Missing	System	71	19,2		
Total		369	100,0		

Table B.10 Sailing/motor boating

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	177	48,0	59,4	59,4
	yes	121	32,8	40,6	100,0
	Total	298	80,8	100,0	
Missing	System	71	19,2		
Total		369	100,0		

Table B.11 surfing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	289	78,3	97,3	97,3
	yes	8	2,2	2,7	100,0
	Total	297	80,5	100,0	
Missing	System	72	19,5		
Total		369	100,0		

Table B.12 Hiking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	130	35,2	43,6	43,6
	yes	168	45,5	56,4	100,0
	Total	298	80,8	100,0	
Missing	System	71	19,2		
Total		369	100,0		

Table B.13 Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	173	46,9	58,1	58,1
	yes	125	33,9	41,9	100,0
	Total	298	80,8	100,0	
Missing	System	71	19,2		
Total		369	100,0		

Table B.14 0pinion about the pollution in the area?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very polluted	44	11,9	12,0	12,0
	polluted	125	33,9	34,0	45,9
	neither polluted nor clean	128	34,7	34,8	80,7
	clean	64	17,3	17,4	98,1
	very clean	7	1,9	1,9	100,0
	Total	368	99,7	100,0	
Missing	System	1	,3		
Total		369	100,0		

Table.15 In which areas should this region be improvement?

in which areas should this region be improvement?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	tourism	64	17,3	17,7	17,7
	agriculture	1	,3	,3	18,0
	social cultural activities	16	4,3	4,4	22,4
	city planning	165	44,7	45,7	68,1
	education	35	9,5	9,7	77,8
	industrialization	2	,5	,6	78,4
	development of city from all aspects	22	6,0	6,1	84,5
	Water sports, other sports	10	2,7	2,8	87,3
	Transportation	2	,5	,6	87,8
	Drinking water	2	,5	,6	88,4
	Introduction of the city	4	1,1	1,1	89,5
	Entertainment facilities	7	1,9	1,9	91,4
	there is no any area should be improved	12	3,3	3,3	94,7
	No more construction	15	4,1	4,2	98,9
	Sulunger lake	2	,5	,6	99,4
	Strict rules of APSA	2	,5	,6	100,0
	Total	361	97,8	100,0	
Missing	System	8	2,2		
Total		369	100,0		

B.16 Most important characteristic that describes this city?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agricultural products,citrus fruits and sweet gum oil	4	1,1	1,1	1,1
	tourism throughout the year	25	6,8	6,8	7,9
	natural beauty and serenity	175	47,4	47,9	55,9
	turtles	87	23,6	23,8	79,7
	thermal springs	4	1,1	1,1	80,8
	channel	26	7,0	7,1	87,9
	stone tombs	9	2,4	2,5	90,4
	Kaunos-historical place	24	6,5	6,6	97,0
	others	8	2,2	2,2	99,2
	every part of the city	3	,8	,8	100,0
	Total	365	98,9	100,0	
Missing	System	4	1,1		
Total		369	100,0		

Table B.17 If the wastewater treatment plant is not operated,do you believe in the pos biliy that what is explained to you shall occur?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	17	4,6	4,6	4,6
	yes	337	91,3	91,6	96,2
	don't know/not sure	14	3,8	3,8	100,0
	Total	368	99,7	100,0	
Missing	System	1	,3		
Total		369	100,0		

Table B.18 In comparison to what you knew before this interview

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	you believed that the situation was less important than what	38	10,3	10,5	10,5
	you believed that the situation was much less than what is t	31	8,4	8,6	19,1
	you knew that the situation was at least as critical as it i	207	56,1	57,3	76,5
	you knew that the situation was important	52	14,1	14,4	90,9
	you knew that the situation was critically important	16	4,3	4,4	95,3
	don't know	17	4,6	4,7	100,0
	Total	361	97,8	100,0	
Missing	System	8	2,2		
Total		369	100,0		

Table B.19 The most important benefit for you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	suitable for swimming	45	12,2	12,5	12,5
	suitable for human contacts	15	4,1	4,2	16,7
	using well water as the tap water	87	23,6	24,2	40,8
	all are equally important	166	45,0	46,1	86,9
	others	45	12,2	12,5	99,4
	don't know	2	,5	,6	100,0
	Total	360	97,6	100,0	
Missing	System	9	2,4		
Total		369	100,0		

Table B.20 Do you know that how much the septic tank costs to you per n nth?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	159	43,1	43,3	43,3
	yes	195	52,8	53,1	96,5
	infiltrating	9	2,4	2,5	98,9
	don't have	4	1,1	1,1	100,0
	Total	367	99,5	100,0	
Missing	System	2	,5		
Total		369	100,0		

Table B.21 Average value for the septic tank costs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5 million TL	42	11,4	24,1	24,1
	5-10 million TL	46	12,5	26,4	50,6
	10-15 million TL	26	7,0	14,9	65,5
	15 million TL and more	60	16,3	34,5	100,0
	Total	174	47,2	100,0	
Missing	System	195	52,8		
Total		369	100,0		

Table B.22 Aprove to pay extra money per month?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	21	5,7	5,7	5,7
	yes	343	93,0	93,2	98,9
	don't know/not sure	4	1,1	1,1	100,0
	Total	368	99,7	100,0	
Missing	System	1	,3		
Total		369	100,0		

Table B.23 How much do you currently pay for your montly water bill?

how much do you currently pay for your monthly water bill?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	400000	1	,3	,3	,3
	500000	1	,3	,3	,6
	1000000	6	1,6	1,7	2,3
	1250000	1	,3	,3	2,6
	1500000	6	1,6	1,7	4,3
	2000000	38	10,3	10,9	15,2
	2500000	18	4,9	5,2	20,3
	2750000	1	,3	,3	20,6
	3000000	34	9,2	9,7	30,4
	3500000	6	1,6	1,7	32,1
	4000000	32	8,7	9,2	41,3
	4500000	3	,8	,9	42,1
	5000000	63	17,1	18,1	60,2
	6000000	9	2,4	2,6	62,8
	6250000	1	,3	,3	63,0
	7000000	6	1,6	1,7	64,8
	7500000	10	2,7	2,9	67,6
	8000000	8	2,2	2,3	69,9
	9000000	1	,3	,3	70,2
	10000000	34	9,2	9,7	79,9
	12500000	6	1,6	1,7	81,7
	13000000	1	,3	,3	81,9
	15000000	15	4,1	4,3	86,2
	20000000	13	3,5	3,7	90,0
	21000000	1	,3	,3	90,3
	25000000	9	2,4	2,6	92,8
	30000000	4	1,1	1,1	94,0
	35000000	3	,8	,9	94,8
	37500000	1	,3	,3	95,1
	40000000	1	,3	,3	95,4
	45000000	1	,3	,3	95,7
	50000000	4	1,1	1,1	96,8
	60000000	1	,3	,3	97,1
	75000000	1	,3	,3	97,4
	100000000	1	,3	,3	97,7
	120000000	1	,3	,3	98,0
	125000000	1	,3	,3	98,3
	150000000	4	1,1	1,1	99,4
	250000000	1	,3	,3	99,7
	275000000	1	,3	,3	100,0
	Total	349	94,6	100,0	
Missing	System	20	5,4		
Total		369	100,0		

Table B.24 Bid number

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	%30	43	11,7	11,7	11,7
	%40	48	13,0	13,0	24,7
	%50	41	11,1	11,1	35,8
	%60	49	13,3	13,3	49,1
	%70	43	11,7	11,7	60,7
	%80	51	13,8	13,8	74,5
	%90	47	12,7	12,7	87,3
	%100	47	12,7	12,7	100,0
	Total	369	100,0	100,0	

Table B.25 Willing to pay more money

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	55	14,9	15,0	15,0
	yes	307	83,2	83,9	98,9
	not sure	4	1,1	1,1	100,0
	Total	366	99,2	100,0	
Missing	System	3	,8		
Total		369	100,0		

Table B.26 Why?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	it's too much for your income	44	11,9	36,4	36,4
	health-purification	30	8,1	24,8	61,2
	protection of the environment	20	5,4	16,5	77,7
	it must be seperated in the bill	1	,3	,8	78,5
	appropriateness of the services	5	1,4	4,1	82,6
	it's appropriate for my income	9	2,4	7,4	90,1
	every service has a cost	4	1,1	3,3	93,4
	no income in winter season	2	,5	1,7	95,0
	Paying less compare with sewage truck	6	1,6	5,0	100,0
	Total	121	32,8	100,0	
Missing	System	248	67,2		
Total		369	100,0		

Table B.27 If the pollution rate in lake increases to a level higher than today,d ɔ you think that the people who are affected should receive compensation for their losses?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	339	91,9	92,4	92,4
	yes	24	6,5	6,5	98,9
	don't know	4	1,1	1,1	100,0
	Total	367	99,5	100,0	
Missing	System	2	,5		
Total		369	100,0		

Table B.28 How old are you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-30	103	27,9	27,9	27,9
	31-40	110	29,8	29,8	57,7
	41-50	95	25,7	25,7	83,5
	51-60	44	11,9	11,9	95,4
	61-70	15	4,1	4,1	99,5
	more than 70	2	,5	,5	100,0
	Total	369	100,0	100,0	

Table B.29 Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	288	78,0	78,3	78,3
	female	80	21,7	21,7	100,0
	Total	368	99,7	100,0	
Missing	System	1	,3		
Total		369	100,0		

Table B.30 Education level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	primary school	112	30,4	30,6	30,6
	secondary school	53	14,4	14,5	45,1
	high school	123	33,3	33,6	78,7
	university	69	18,7	18,9	97,5
	other	9	2,4	2,5	100,0
	Total	366	99,2	100,0	
Missing	System	3	,8		
Total		369	100,0		

Table B.31 Marital status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	single	95	25,7	25,7	25,7
	married	251	68,0	68,0	93,8
	seperated or widow	23	6,2	6,2	100,0
	Total	369	100,0	100,0	

Table B.32 Have any child?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	82	22,2	25,2	25,2
	yes	242	65,6	74,5	99,7
	5	1	,3	,3	100,0
	Total	325	88,1	100,0	
Missing	System	44	11,9		
Total		369	100,0		

Table B.33 How many of your children(younger than 18) live with yc ?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	99	26,8	37,4	37,4
	1	81	22,0	30,6	67,9
	2	73	19,8	27,5	95,5
	3	10	2,7	3,8	99,2
	4	2	,5	,8	100,0
	Total	265	71,8	100,0	
Missing	System	104	28,2		
Total		369	100,0		

Table B.34 How many of your children(adult) live with you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	223	60,4	83,8	83,8
	1	31	8,4	11,7	95,5
	2	10	2,7	3,8	99,2
	3	2	,5	,8	100,0
	Total	266	72,1	100,0	
Missing	System	103	27,9		
Total		369	100,0		

Table B.35 How many of your children(total) live with you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	75	20,3	27,6	27,6
	1	82	22,2	30,1	57,7
	2	100	27,1	36,8	94,5
	3	12	3,3	4,4	98,9
	4	3	,8	1,1	100,0
	Total	272	73,7	100,0	
Missing	System	97	26,3		
Total		369	100,0		

Table B.36 Your occupation?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	hotel	39	10,6	10,6	10,6
	farmer	12	3,3	3,3	13,9
	fisherman	3	,8	,8	14,7
	tradesman	80	21,7	21,7	36,4
	owner of the boat	32	8,7	8,7	45,1
	civil servant	18	4,9	4,9	50,0
	doctor,engineer,lawyer etc.	14	3,8	3,8	53,8
	skilled worker	15	4,1	4,1	57,9
	unskilled worker	7	1,9	1,9	59,8
	other	84	22,8	22,8	82,6
	retired	20	5,4	5,4	88,0
	housewife	6	1,6	1,6	89,7
	tourism	38	10,3	10,3	100,0
	Total	368	99,7	100,0	
Missing	System	1	,3		
Total		369	100,0		

Table B.37 Do you work in the tourism sector?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	127	34,4	36,9	36,9
	yes	217	58,8	63,1	100,0
	Total	344	93,2	100,0	
Missing	System	25	6,8		
Total		369	100,0		

Table B.38 How long have you been working in the tourism sector?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5 years	35	9,5	16,2	16,2
	5-10 years	57	15,4	26,4	42,6
	10-15 years	59	16,0	27,3	69,9
	15 years and more	65	17,6	30,1	100,0
	Total	216	58,5	100,0	
Missing	System	153	41,5		
Total		369	100,0		

Table B.39 Your monthly household income?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 100 million TL	7	1,9	1,9	1,9
	100-200 million TL	42	11,4	11,5	13,5
	200-300 million TL	64	17,3	17,6	31,0
	300-400 million TL	63	17,1	17,3	48,4
	400-500 million TL	44	11,9	12,1	60,4
	500-600 million TL	50	13,6	13,7	74,2
	600-700 million TL	18	4,9	4,9	79,1
	700-800 million TL	15	4,1	4,1	83,2
	800-900 million TL	3	,8	,8	84,1
	900-1 billion TL	13	3,5	3,6	87,6
	more than 1 billion TL	45	12,2	12,4	100,0
	Total	364	98,6	100,0	
Missing	System	5	1,4		
Total		369	100,0		

Table B.40 Who says the final word in your house?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	you	184	49,9	50,0	50,0
	father	43	11,7	11,7	61,7
	mother	6	1,6	1,6	63,3
	together	128	34,7	34,8	98,1
	other	7	1,9	1,9	100,0
	Total	368	99,7	100,0	
Missing	System	1	,3		
Total		369	100,0		

Table B.41 Where do you live?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	rented house	106	28,7	28,7	28,7
	own house	231	62,6	62,6	91,3
	in the house of the family	22	6,0	6,0	97,3
	any accommodation supplied by the employer	2	,5	,5	97,8
	others	8	2,2	2,2	100,0
	Total	369	100,0	100,0	

Table B.42 You or your family own a house

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	115	31,2	31,3	31,3
	yes	252	68,3	68,7	100,0
	Total	367	99,5	100,0	
Missing	System	2	,5		
Total		369	100,0		

Table B.43 You or your family own an agricultural land

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	228	61,8	62,1	62,1
	yes	139	37,7	37,9	100,0
	Total	367	99,5	100,0	
Missing	System	2	,5		
Total		369	100,0		

Table B.44 You or your family own a car

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	194	52,6	53,0	53,0
	yes	172	46,6	47,0	100,0
	Total	366	99,2	100,0	
Missing	System	3	,8		
Total		369	100,0		

Table B.45 You or your family own a boat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	282	76,4	76,8	76,8
	yes	85	23,0	23,2	100,0
	Total	367	99,5	100,0	
Missing	System	2	,5		
Total		369	100,0		

Table B.46 You or your family own ....others

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	299	81,0	81,5	81,5
	yes	68	18,4	18,5	100,0
	Total	367	99,5	100,0	
Missing	System	2	,5		
Total		369	100,0		

Table B.47 Membership of a society or an organization?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	292	79,1	79,6	79,6
	yes	75	20,3	20,4	100,0
	Total	367	99,5	100,0	
Missing	System	2	,5		
Total		369	100,0		

CROSS TABULATION

Table B.48 Education level * willing to pay more money Crosstabulation

% within education level

		willing to pay more money			
		no	yes	not sure	Total
education level	primary school	16,1%	83,0%	,9%	100,0%
	secondary school	17,0%	83,0%		100,0%
	high school	13,1%	85,2%	1,6%	100,0%
	university	14,7%	83,8%	1,5%	100,0%
	other	22,2%	77,8%		100,0%
Total		15,1%	83,8%	1,1%	100,0%

Table B.49 Gender * willing to pay more money Crosstabulation

% within gender

		willing to pay more money			
		no	yes	not sure	Total
gender	male	16,1%	83,2%	,7%	100,0%
	female	11,3%	86,3%	2,5%	100,0%
Total		15,1%	83,8%	1,1%	100,0%

Table B.50 Your monthly household income? * willing to pay more money

% within Your monthly household income?

		willing to pay more money			
		no	yes	not sure	Total
Your monthly household income?	less than 100 million TL		100,0%		100,0%
	100-200 million TL	21,4%	73,8%	4,8%	100,0%
	200-300 million TL	15,9%	84,1%		100,0%
	300-400 million TL	9,5%	88,9%	1,6%	100,0%
	400-500 million TL	18,2%	81,8%		100,0%
	500-600 million TL	14,3%	85,7%		100,0%
	600-700 million TL		100,0%		100,0%
	700-800 million TL	13,3%	86,7%		100,0%
	800-900 million TL		100,0%		100,0%
	900-1 billion TL	7,7%	92,3%		100,0%
	more than 1 billion TL	25,0%	72,7%	2,3%	100,0%
Total		15,0%	83,9%	1,1%	100,0%

Table B.51 Your occupation? * willing to pay more money Crosstabulation

% within your occupation?

		willing to pay more money			
		no	yes	not sure	Total
your occupation?	hotel	26,3%	71,1%	2,6%	100,0%
	farmer	8,3%	91,7%		100,0%
	fisherman	33,3%	66,7%		100,0%
	tradesman	15,0%	85,0%		100,0%
	owner of the boat	25,8%	74,2%		100,0%
	civil servant	11,1%	88,9%		100,0%
	doctor,engineer,lawyer etc.	14,3%	78,6%	7,1%	100,0%
	skilled worker	6,7%	93,3%		100,0%
	unskilled worker	14,3%	85,7%		100,0%
	other	8,4%	90,4%	1,2%	100,0%
	retired	10,0%	90,0%		100,0%
	housewife		100,0%		100,0%
	tourism	18,4%	78,9%	2,6%	100,0%
Total		14,8%	84,1%	1,1%	100,0%

Table B.52 Do you work in the tourism sector? * willing to pay more m ey

% within Do you work in the tourism sector?

		willing to pay more money			
		no	yes	not sure	Total
Do you work in the tourism sector?	no	7,9%	91,3%	,8%	100,0%
	yes	18,1%	80,5%	1,4%	100,0%
Total		14,4%	84,5%	1,2%	100,0%

Table B.53 How old are you? * willing to pay more money Crosstab ation

% within how old are you?

		willing to pay more money			
		no	yes	not sure	Total
how old are you?	18-30	14,7%	84,3%	1,0%	100,0%
	31-40	12,7%	86,4%	,9%	100,0%
	41-50	18,9%	80,0%	1,1%	100,0%
	51-60	11,9%	88,1%		100,0%
	61-70	20,0%	73,3%	6,7%	100,0%
	more than 70		100,0%		100,0%
Total		15,0%	83,9%	1,1%	100,0%

Table B.54 Bid number * willing to pay more money

% within bid number

		willing to pay more money			
		no	yes	not sure	Total
bid number	%30	2,4%	97,6%		100,0%
	%40	12,8%	87,2%		100,0%
	%50	4,9%	90,2%	4,9%	100,0%
	%60	14,6%	83,3%	2,1%	100,0%
	%70	20,9%	79,1%		100,0%
	%80	17,6%	82,4%		100,0%
	%90	29,8%	68,1%	2,1%	100,0%
	%100	14,9%	85,1%		100,0%
Total		15,0%	83,9%	1,1%	100,0%

Table B.55 how much do you currently pay for your monthly water bill? * willing to pay

how much do you currently pay for your monthly water bill? * willing to pay more money Crosstabulation

% within how much do you currently pay for your monthly water bill?

		willing to pay more money			
		no	yes	not sure	Total
how much do you currently pay for your monthly water bill?	400000	100,0%			100,0%
	500000		100,0%		100,0%
	1000000		100,0%		100,0%
	1250000		100,0%		100,0%
	1500000		100,0%		100,0%
	2000000	13,2%	84,2%	2,6%	100,0%
	2500000	5,6%	94,4%		100,0%
	2750000		100,0%		100,0%
	3000000	5,9%	94,1%		100,0%
	3500000		100,0%		100,0%
	4000000	15,6%	84,4%		100,0%
	4500000		100,0%		100,0%
	5000000	9,5%	90,5%		100,0%
	6000000		100,0%		100,0%
	6250000		100,0%		100,0%
	7000000		100,0%		100,0%
	7500000	10,0%	90,0%		100,0%
	8000000	12,5%	87,5%		100,0%
	9000000		100,0%		100,0%
	10000000	14,7%	85,3%		100,0%
	12500000	33,3%	66,7%		100,0%
	13000000		100,0%		100,0%
	15000000	6,7%	86,7%	6,7%	100,0%
	20000000	15,4%	76,9%	7,7%	100,0%
	21000000		100,0%		100,0%
	25000000	33,3%	66,7%		100,0%
	30000000		100,0%		100,0%
	35000000	66,7%	33,3%		100,0%
	37500000	100,0%			100,0%
	40000000		100,0%		100,0%
	45000000	100,0%			100,0%
	50000000		100,0%		100,0%
	60000000		100,0%		100,0%
	75000000		100,0%		100,0%
	100000000	100,0%			100,0%
	120000000		100,0%		100,0%
	125000000		100,0%		100,0%
	150000000	50,0%	50,0%		100,0%
	250000000	100,0%			100,0%
	275000000	100,0%			100,0%
Total		12,6%	86,5%	,9%	100,0%

APPENDIX C Results of the Frequency Distributions from SPSS Program of KÖYCEĞİZ survey

Table C.1 Do you have an artesian well?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	231	62,8	62,8	62,8
	yes	137	37,2	37,2	100,0
	Total	368	100,0	100,0	

Table C.2 Do you use water from your well as potable water?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	82	22,3	57,3	57,3
	yes	61	16,6	42,7	100,0
	Total	143	38,9	100,0	
Missing	System	225	61,1		
Total		368	100,0		

Table C.3 Connection to the sewerage system?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	207	56,3	58,6	58,6
	yes	143	38,9	40,5	99,2
	don't know/not sure	3	,8	,8	100,0
	Total	353	95,9	100,0	
Missing	System	15	4,1		
Total		368	100,0		

Table C.4 Have a septic tank?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	29	7,9	11,1	11,1
	yes	232	63,0	88,9	100,0
	Total	261	70,9	100,0	
Missing	System	107	29,1		
Total		368	100,0		

Table C.5 A problem with your septic tank?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	256	69,6	69,8	69,8
	yes	108	29,3	29,4	99,2
	don't know/not sure	3	,8	,8	100,0
	Total	367	99,7	100,0	
Missing	System	1	,3		
Total		368	100,0		

Table C.6 How often do you have a recreational activities?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	never	32	8,7	9,3	9,3
	very often	124	33,7	35,9	45,2
	not very often	189	51,4	54,8	100,0
	Total	345	93,8	100,0	
Missing	System	23	6,3		
Total		368	100,0		

Table C.7 Prefered time for recreational activities?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	only summer	132	35,9	43,4	43,4
	not specific season/every year	172	46,7	56,6	100,0
	Total	304	82,6	100,0	
Missing	System	64	17,4		
Total		368	100,0		

Table C.8 Swimming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	164	44,6	50,3	50,3
	yes	162	44,0	49,7	100,0
	Total	326	88,6	100,0	
Missing	System	42	11,4		
Total		368	100,0		

Table C.9 Fishing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	259	70,4	79,4	79,4
	yes	67	18,2	20,6	100,0
	Total	326	88,6	100,0	
Missing	System	42	11,4		
Total		368	100,0		

Table C.10 Sailing/motor boating

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	222	60,3	68,1	68,1
	yes	104	28,3	31,9	100,0
	Total	326	88,6	100,0	
Missing	System	42	11,4		
Total		368	100,0		

Table C.11 Surfing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	317	86,1	97,5	97,5
	yes	8	2,2	2,5	100,0
	Total	325	88,3	100,0	
Missing	System	43	11,7		
Total		368	100,0		

Table C.12 Hiking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	132	35,9	40,6	40,6
	yes	193	52,4	59,4	100,0
	Total	325	88,3	100,0	
Missing	System	43	11,7		
Total		368	100,0		

Table C.13 Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	159	43,2	49,1	49,1
	yes	165	44,8	50,9	100,0
	Total	324	88,0	100,0	
Missing	System	44	12,0		
Total		368	100,0		

Table C.14 Opinion about the pollution in the area?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very polluted	31	8,4	8,5	8,5
	polluted	112	30,4	30,6	39,1
	neither polluted nor clean	123	33,4	33,6	72,7
	clean	96	26,1	26,2	98,9
	very clean	4	1,1	1,1	100,0
	Total	366	99,5	100,0	
Missing	System	2	,5		
Total		368	100,0		

Table C.15 In which areas should this region be improvement?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	tourism	126	34,2	35,0	35,0
	agriculture	5	1,4	1,4	36,4
	social cultural activities	24	6,5	6,7	43,1
	city planning	82	22,3	22,8	65,8
	education	30	8,2	8,3	74,2
	industrialization	11	3,0	3,1	77,2
	Development of the side of the lake	17	4,6	4,7	81,9
	Water sports, other sports	6	1,6	1,7	83,6
	Don't know	1	,3	,3	83,9
	others	58	15,8	16,1	100,0
	Total	360	97,8	100,0	
Missing	System	8	2,2		
Total		368	100,0		

Table C.16 Most important characteristic that describes this city?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agricultural products,citrus fruits and sweet gum oil	28	7,6	7,8	7,8
	tourism throughout the year	3	,8	,8	8,6
	natural beauty and serenity	246	66,8	68,5	77,2
	lake	44	12,0	12,3	89,4
	others	21	5,7	5,8	95,3
	don't know	1	,3	,3	95,5
	honey	3	,8	,8	96,4
	no any	5	1,4	1,4	97,8
	historical places	6	1,6	1,7	99,4
	every part of the city	2	,5	,6	100,0
	Total	359	97,6	100,0	
Missing	System	9	2,4		
Total		368	100,0		

Table C.17 If the wastewater treatment plant is not operated,do you believe in the pos biliy that what is explained to you shall occur?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	13	3,5	3,6	3,6
	yes	341	92,7	94,2	97,8
	don't know/not sure	8	2,2	2,2	100,0
	Total	362	98,4	100,0	
Missing	System	6	1,6		
Total		368	100,0		

Table C.18 In comparison to what you knew before this interview

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	you believed that the situation was less important than what	40	10,9	11,3	11,3
	you believed that the situation was much less than what is t	42	11,4	11,9	23,2
	you knew that the situation was at least as critical as it i	187	50,8	52,8	76,0
	you knew that the situation was important	30	8,2	8,5	84,5
	you knew that the situation was critically important	48	13,0	13,6	98,0
	don't know	7	1,9	2,0	100,0
	Total	354	96,2	100,0	
Missing	System	14	3,8		
Total		368	100,0		

Table C.19 The most important benefit for you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	suitable for swimming	46	12,5	13,0	13,0
	suitable for human contacts	46	12,5	13,0	26,1
	using well water as the tap water	88	23,9	24,9	51,0
	all are equally important	125	34,0	35,4	86,4
	others	44	12,0	12,5	98,9
	don't know	4	1,1	1,1	100,0
	Total	353	95,9	100,0	
Missing	System	15	4,1		
Total		368	100,0		

Table C.20 Do you know that how much the septic tank costs to you per month?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	190	51,6	52,2	52,2
	yes	119	32,3	32,7	84,9
	infiltrating	7	1,9	1,9	86,8
	don't have	48	13,0	13,2	100,0
	Total	364	98,9	100,0	
Missing	System	4	1,1		
Total		368	100,0		

Table C.21 Average value for the septic tank costs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5 million TL	18	4,9	17,3	17,3
	5-10 million TL	19	5,2	18,3	35,6
	10-15 million TL	25	6,8	24,0	59,6
	15 million TL and more	42	11,4	40,4	100,0
	Total	104	28,3	100,0	
Missing	System	264	71,7		
Total		368	100,0		

Table C.22 Approve to pay extra money per month?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	35	9,5	9,5	9,5
	yes	324	88,0	88,3	97,8
	don't know/not sure	8	2,2	2,2	100,0
	Total	367	99,7	100,0	
Missing	System	1	,3		
Total		368	100,0		

Table C.23 How much do you currently pay for your monthly water bil

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1500000	3	,8	,9	,9
	1750000	2	,5	,6	1,5
	2000000	12	3,3	3,6	5,0
	2500000	9	2,4	2,7	7,7
	2750000	1	,3	,3	8,0
	3000000	14	3,8	4,1	12,1
	3250000	1	,3	,3	12,4
	3500000	17	4,6	5,0	17,5
	4000000	29	7,9	8,6	26,0
	4500000	1	,3	,3	26,3
	5000000	80	21,7	23,7	50,0
	6000000	15	4,1	4,4	54,4
	7000000	7	1,9	2,1	56,5
	7500000	20	5,4	5,9	62,4
	8000000	10	2,7	3,0	65,4
	9000000	1	,3	,3	65,7
	10000000	57	15,5	16,9	82,5
	11000000	1	,3	,3	82,8
	12000000	5	1,4	1,5	84,3
	12500000	4	1,1	1,2	85,5
	13000000	3	,8	,9	86,4
	15000000	19	5,2	5,6	92,0
	17500000	3	,8	,9	92,9
	18000000	1	,3	,3	93,2
	20000000	7	1,9	2,1	95,3
	25000000	4	1,1	1,2	96,4
	30000000	5	1,4	1,5	97,9
	37500000	1	,3	,3	98,2
	40000000	2	,5	,6	98,8
	50000000	2	,5	,6	99,4
	75000000	1	,3	,3	99,7
	100000000	1	,3	,3	100,0
	Total	338	91,8	100,0	
Missing	System	30	8,2		
Total		368	100,0		

Table C.24 Bid no :

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	%30	42	11,4	11,4	11,4
	%40	47	12,8	12,8	24,3
	%50	44	12,0	12,0	36,2
	%60	46	12,5	12,5	48,8
	%70	43	11,7	11,7	60,5
	%80	46	12,5	12,5	73,0
	%90	51	13,9	13,9	86,9
	100%	48	13,0	13,1	100,0
	Total	367	99,7	100,0	
Missing	System	1	,3		
Total		368	100,0		

Table C.25 Willing to pay more money?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	99	26,9	27,0	27,0
	yes	255	69,3	69,7	96,7
	don't know/not sure	12	3,3	3,3	100,0
	Total	366	99,5	100,0	
Missing	System	2	,5		
Total		368	100,0		

Table C.26 Why?

why?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	it's too much for your income	81	22,0	41,5	41,5
	health-purification	21	5,7	10,8	52,3
	protection of the environment	40	10,9	20,5	72,8
	it must be seperated in the bill	1	,3	,5	73,3
	appropriateness of the services	19	5,2	9,7	83,1
	it's appropriate for my income	8	2,2	4,1	87,2
	already not to pay too much	2	,5	1,0	88,2
	everything has a cost	3	,8	1,5	89,7
	renter; owner has to pay	1	,3	,5	90,3
	if everybody pays, he can pay	1	,3	,5	90,8
	we have to pay	8	2,2	4,1	94,9
	water is plentiful , no need to pay	1	,3	,5	95,4
	our water consumption is too much	1	,3	,5	95,9
	septic tank is not a problem	1	,3	,5	96,4
	not necessary to pay for wasterwater	2	,5	1,0	97,4
	no bill coming	3	,8	1,5	99,0
	depends on his economic situation	1	,3	,5	99,5
	payment necessary for drinkingwater but	1	,3	,5	100,0
	Total	195	53,0	100,0	
Missing	System	173	47,0		
Total		368	100,0		

Table C.27 If the pollution rate in lake increases to a level higher than today,d you think that the people who are affected should receive compensation for their losses?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	338	91,8	93,9	93,9
	yes	18	4,9	5,0	98,9
	don't know	4	1,1	1,1	100,0
	Total	360	97,8	100,0	
Missing	System	8	2,2		
Total		368	100,0		

Table C.28 Location of your residence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	gelişim	92	25,0	25,8	25,8
	gülpınar	111	30,2	31,2	57,0
	ulucami	110	29,9	30,9	87,9
	yenimahalle	33	9,0	9,3	97,2
	maras	4	1,1	1,1	98,3
	osmanağalar	4	1,1	1,1	99,4
	çavuşlar	1	,3	,3	99,7
	merkez	1	,3	,3	100,0
	Total	356	96,7	100,0	
Missing	System	12	3,3		
Total		368	100,0		

Table C.29 How old are you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-30	65	17,7	17,8	17,8
	31-40	105	28,5	28,8	46,6
	41-50	114	31,0	31,2	77,8
	51-60	48	13,0	13,2	91,0
	61-70	24	6,5	6,6	97,5
	more than 70	9	2,4	2,5	100,0
	Total	365	99,2	100,0	
Missing	System	3	,8		
Total		368	100,0		

Table C.30 Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	245	66,6	67,3	67,3
	female	119	32,3	32,7	100,0
	Total	364	98,9	100,0	
Missing	System	4	1,1		
Total		368	100,0		

Table C.31 Education level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	primary school	87	23,6	24,0	24,0
	secondary school	48	13,0	13,2	37,2
	high school	117	31,8	32,2	69,4
	university	99	26,9	27,3	96,7
	other	12	3,3	3,3	100,0
	Total	363	98,6	100,0	
Missing	System	5	1,4		
Total		368	100,0		

Table C.32 Marital status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	single	55	14,9	15,1	15,1
	married	285	77,4	78,3	93,4
	seperated or widow	24	6,5	6,6	100,0
	Total	364	98,9	100,0	
Missing	System	4	1,1		
Total		368	100,0		

Table C.33 Have any child?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	41	11,1	12,2	12,2
	yes	296	80,4	87,8	100,0
	Total	337	91,6	100,0	
Missing	System	31	8,4		
Total		368	100,0		

Table C.34 How many of your children(younger than 18) live with yc ?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	95	25,8	32,4	32,4
	1	102	27,7	34,8	67,2
	2	84	22,8	28,7	95,9
	3	11	3,0	3,8	99,7
	6	1	,3	,3	100,0
	Total	293	79,6	100,0	
Missing	System	75	20,4		
Total		368	100,0		

Table C.35 How many of your children(adult) live with you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	224	60,9	76,7	76,7
	1	42	11,4	14,4	91,1
	2	21	5,7	7,2	98,3
	3	3	,8	1,0	99,3
	4	2	,5	,7	100,0
	Total	292	79,3	100,0	
Missing	System	76	20,7		
Total		368	100,0		

Table C.36 How many of your children(total) live with you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	59	16,0	20,1	20,1
	1	92	25,0	31,3	51,4
	2	123	33,4	41,8	93,2
	3	16	4,3	5,4	98,6
	4	3	,8	1,0	99,7
	6	1	,3	,3	100,0
	Total	294	79,9	100,0	
Missing	System	74	20,1		
Total		368	100,0		

Table C.37 Your occupation?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	hotel	10	2,7	2,8	2,8
	agricultural worker	2	,5	,6	3,3
	farmer	1	,3	,3	3,6
	fisherman	2	,5	,6	4,1
	tradesman	76	20,7	20,9	25,1
	owner of the boat	3	,8	,8	25,9
	civil servant	86	23,4	23,7	49,6
	doctor,engineer,lawyer etc.	24	6,5	6,6	56,2
	skilled worker	18	4,9	5,0	61,2
	unskilled worker	10	2,7	2,8	63,9
	other	89	24,2	24,5	88,4
	retired	42	11,4	11,6	100,0
	Total	363	98,6	100,0	
Missing	System	5	1,4		
Total		368	100,0		

Table C.38 Do you work in the tourism sector?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	301	81,8	83,1	83,1
	yes	59	16,0	16,3	99,4
	don't know/not sure	2	,5	,6	100,0
	Total	362	98,4	100,0	
Missing	System	6	1,6		
Total		368	100,0		

Table C.39 How long have you been working in the tourism sector?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5 years	14	3,8	23,7	23,7
	5-10 years	14	3,8	23,7	47,5
	10-15 years	16	4,3	27,1	74,6
	15 years and more	15	4,1	25,4	100,0
	Total	59	16,0	100,0	
Missing	System	309	84,0		
Total		368	100,0		

Table C.40 Your monthly household income?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 100 million TL	6	1,6	1,7	1,7
	100-200 million TL	40	10,9	11,1	12,7
	200-300 million TL	63	17,1	17,5	30,2
	300-400 million TL	56	15,2	15,5	45,7
	400-500 million TL	37	10,1	10,2	56,0
	500-600 million TL	49	13,3	13,6	69,5
	600-700 million TL	24	6,5	6,6	76,2
	700-800 million TL	18	4,9	5,0	81,2
	800-900 million TL	10	2,7	2,8	83,9
	900-1 billion TL	20	5,4	5,5	89,5
	more than 1 billion TL	38	10,3	10,5	100,0
	Total	361	98,1	100,0	
Missing	System	7	1,9		
Total		368	100,0		

Table C.41 Who says the final word in your house?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	you	141	38,3	38,7	38,7
	father	33	9,0	9,1	47,8
	mother	11	3,0	3,0	50,8
	together	151	41,0	41,5	92,3
	other	28	7,6	7,7	100,0
	Total	364	98,9	100,0	
Missing	System	4	1,1		
Total		368	100,0		

Table C.42 Where do you live?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	rented house	110	29,9	30,3	30,3
	own house	202	54,9	55,6	86,0
	in the house of the family	26	7,1	7,2	93,1
	any accommodation supplied by the employer	21	5,7	5,8	98,9
	others	4	1,1	1,1	100,0
	Total	363	98,6	100,0	
Missing	System	5	1,4		
Total		368	100,0		

Table C.43 You or your family own a house

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	104	28,3	29,3	29,3
	yes	251	68,2	70,7	100,0
	Total	355	96,5	100,0	
Missing	System	13	3,5		
Total		368	100,0		

Table C.44 You or your family own an agricultural land

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	237	64,4	66,9	66,9
	yes	117	31,8	33,1	100,0
	Total	354	96,2	100,0	
Missing	System	14	3,8		
Total		368	100,0		

Table C.45 You or your family own a car

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	164	44,6	46,3	46,3
	yes	190	51,6	53,7	100,0
	Total	354	96,2	100,0	
Missing	System	14	3,8		
Total		368	100,0		

Table C.46 You or your family own a boat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	332	90,2	93,8	93,8
	yes	22	6,0	6,2	100,0
	Total	354	96,2	100,0	
Missing	System	14	3,8		
Total		368	100,0		

Table C.47 You or your family own ....others

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	288	78,3	82,3	82,3
	yes	62	16,8	17,7	100,0
	Total	350	95,1	100,0	
Missing	System	18	4,9		
Total		368	100,0		

Table C.48 Membership of a society or an organization?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	252	68,5	72,4	72,4
	yes	96	26,1	27,6	100,0
	Total	348	94,6	100,0	
Missing	System	20	5,4		
Total		368	100,0		

RESULTS OF THE CROSS TABULATION

Table C.49 How old are you? * willing to pay more money? Crosstabul :ion

% within how old are you?

		willing to pay more money?			
		no	yes	don't know/not sure	Total
how old are you?	18-30	26,2%	69,2%	4,6%	100,0%
	31-40	33,7%	65,4%	1,0%	100,0%
	41-50	24,6%	70,2%	5,3%	100,0%
	51-60	22,9%	75,0%	2,1%	100,0%
	61-70	16,7%	79,2%	4,2%	100,0%
	more than 70	44,4%	55,6%		100,0%
Total		27,2%	69,5%	3,3%	100,0%

Table C.50 Bid no : * willing to pay more money? Crosstabula on

% within bid no :

		willing to pay more money?			
		no	yes	don't know/not sure	Total
bid no :	%30	17,1%	80,5%	2,4%	100,0%
	%40	44,7%	53,2%	2,1%	100,0%
	%50	22,7%	72,7%	4,5%	100,0%
	%60	30,4%	69,6%		100,0%
	%70	16,3%	81,4%	2,3%	100,0%
	%80	32,6%	67,4%		100,0%
	%90	23,5%	70,6%	5,9%	100,0%
	100%	27,1%	64,6%	8,3%	100,0%
Total		27,0%	69,7%	3,3%	100,0%

Table C.51 Education level * willing to pay more money? Crosstabulation

% within education level

		willing to pay more money?			
		no	yes	don't know/not sure	Total
education level	primary school	26,4%	64,4%	9,2%	100,0%
	secondary school	29,2%	68,8%	2,1%	100,0%
	high school	28,4%	69,8%	1,7%	100,0%
	university	24,2%	74,7%	1,0%	100,0%
	other	41,7%	58,3%		100,0%
Total		27,3%	69,3%	3,3%	100,0%

Table C.52 Gender * willing to pay more money? Crosstabulatic

% within gender

		willing to pay more money?			
		no	yes	don't know/not sure	Total
gender	male	27,0%	70,1%	2,9%	100,0%
	female	27,7%	68,1%	4,2%	100,0%
Total		27,3%	69,4%	3,3%	100,0%

Table C.53 Your monthly household income? * willing to pay more money? Crosstabu tion

% within Your monthly household income?

		willing to pay more money?			
		no	yes	don't know/not sure	Total
Your monthly household income?	less than 100 million TL	50,0%	50,0%		100,0%
	100-200 million TL	35,0%	57,5%	7,5%	100,0%
	200-300 million TL	22,2%	73,0%	4,8%	100,0%
	300-400 million TL	32,7%	65,5%	1,8%	100,0%
	400-500 million TL	29,7%	70,3%		100,0%
	500-600 million TL	30,6%	65,3%	4,1%	100,0%
	600-700 million TL	25,0%	70,8%	4,2%	100,0%
	700-800 million TL	5,6%	88,9%	5,6%	100,0%
	800-900 million TL	20,0%	80,0%		100,0%
	900-1 billion TL	15,0%	85,0%		100,0%
	more than 1 billion TL	28,9%	68,4%	2,6%	100,0%
Total		27,2%	69,4%	3,3%	100,0%

Table C.54 Your occupation? * willing to pay more money? Crosstabulation

% within your occupation?

		willing to pay more money?			
		no	yes	don't know/not sure	Total
your occupation?	hotel	40,0%	60,0%		100,0%
	agricultural worker		100,0%		100,0%
	farmer		100,0%		100,0%
	fisherman		100,0%		100,0%
	tradesman	28,9%	65,8%	5,3%	100,0%
	owner of the boat		100,0%		100,0%
	civil servant	27,1%	70,6%	2,4%	100,0%
	doctor,engineer,lawyer etc.	25,0%	75,0%		100,0%
	skilled worker	44,4%	50,0%	5,6%	100,0%
	unskilled worker	40,0%	60,0%		100,0%
	other	23,6%	71,9%	4,5%	100,0%
	retired	23,8%	73,8%	2,4%	100,0%
Total		27,1%	69,6%	3,3%	100,0%

Table C.55 Do you work in the tourism sector? * willing to pay more money? Crosstab lation

% within Do you work in the tourism sector?

		willing to pay more money?			
		no	yes	don't know/not sure	Total
Do you work in the tourism sector?	no	25,7%	71,3%	3,0%	100,0%
	yes	33,9%	61,0%	5,1%	100,0%
	don't know/not sure	100,0%			100,0%
Total		27,4%	69,3%	3,3%	100,0%

Table C.56 How much do you currently pay for your monthly water bill? * willing To pay more money?

how much do you currently pay for your monthly water bill? * willing to pay more money? Crosstabulation

% within how much do you currently pay for your monthly water bill?

		willing to pay more money?			
		no	yes	don't know/not sure	Total
how much do you currently pay for your monthly water bill?	1500000	33,3%	66,7%		100,0%
	1750000		50,0%	50,0%	100,0%
	2000000		91,7%	8,3%	100,0%
	2500000	22,2%	77,8%		100,0%
	2750000	100,0%			100,0%
	3000000	28,6%	71,4%		100,0%
	3250000		100,0%		100,0%
	3500000	11,8%	88,2%		100,0%
	4000000	17,2%	82,8%		100,0%
	4500000		100,0%		100,0%
	5000000	22,5%	73,8%	3,8%	100,0%
	6000000	6,7%	86,7%	6,7%	100,0%
	7000000	14,3%	85,7%		100,0%
	7500000	45,0%	50,0%	5,0%	100,0%
	8000000	40,0%	60,0%		100,0%
	9000000		100,0%		100,0%
	10000000	33,3%	63,2%	3,5%	100,0%
	11000000		100,0%		100,0%
	12000000	60,0%	40,0%		100,0%
	12500000	75,0%	25,0%		100,0%
	13000000	33,3%	66,7%		100,0%
	15000000	26,3%	73,7%		100,0%
	17500000	100,0%			100,0%
	18000000		100,0%		100,0%
	20000000	28,6%	42,9%	28,6%	100,0%
	25000000	25,0%	75,0%		100,0%
	30000000	40,0%	60,0%		100,0%
	37500000		100,0%		100,0%
	40000000	50,0%	50,0%		100,0%
	50000000	100,0%			100,0%
	75000000		100,0%		100,0%
	100000000	100,0%			100,0%
Total		26,9%	69,8%	3,3%	100,0%

APPENDIX D POOLDATA SET

APPENDIX E

MODEL 1

Logistic Regression

Table E.1 Case Processing Summary

Unweighted Cases [a]		N	Percent
Selected Cases	Included in Analysis	590	75,0
	Missing Cases	197	25,0
	Total	787	100,0
Unselected Cases		0	,0
Total		787	100,0

a. If weight is in effect, see classification table for the total number of cases.

Table E.2 Dependent Variable E coding

Original Value	Internal Value
no	0
yes	1

Block 0: Beginning Block

Table E.3 Classification Table[a,b]

			Predicted		
			=s18a; don't knows (n=16) recoded as zero bidders; protestbidders eruit gehaald (=missing)		
	Observed		no	yes	Percentage Correct
Step 0	=s18a; don't knows (n=16) recoded as zero bidders; protestbidders eruit gehaald (=missing)	no	0	122	,0
		yes	0	468	100,0
	Overall Percentage				79,3

a. Constant is included in the model.

b. The cut value is ,500

Table E.4 Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	1,344	,102	174,918	1	,000	3,836

Table E.5 Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	NEWBID_A	31,265	1	,000
		PLACE	24,515	1	,000
		P11	6,514	1	,011
		S12	2,585	1	,108
		CURRENT	,000	1	,996
		S6	3,746	1	,053
	Overall Statistics		89,909	6	,000

Block 1: Method = Enter

Table E.6 Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	112,074	6	,000
	Block	112,074	6	,000
	Model	112,074	6	,000

Table E.7 Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	489,323	,173	,271

Table E.8 Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	11,213	8	,190

Table E.9 Contingency Table for Hosmer and Lemeshow Test

		=s18a; don't knows (n=16) recoded as zero bidders; protestbidders eruit gehaald (=missing) = no		=s18a; don't knows (n=16) recoded as zero bidders; protestbidders eruit gehaald (=missing) = yes		
		Observed	Expected	Observed	Expected	Total
Step 1	1	40	37,760	19	21,240	59
	2	18	21,812	41	37,188	59
	3	13	15,807	46	43,193	59
	4	17	12,488	42	46,512	59
	5	8	10,244	51	48,756	59
	6	7	7,864	52	51,136	59
	7	10	6,312	49	52,688	59
	8	2	4,858	57	54,142	59
	9	6	3,463	53	55,537	59
	10	1	1,394	58	57,606	59

Classification Table [a]

			Predicted		
			=s18a; don't knows (n=16) recoded as zero bidders; protestbidders eruit gehaald (=missing)		
	Observed		no	yes	Percentage Correct
Step 1	=s18a; don't knows (n=16) recoded as zero bidders; protestbidders eruit gehaald (=missing)	no	35	87	28,7
		yes	14	454	97,0
	Overall Percentage				82,9

a. The cut value is ,500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	NEWBID_A	-,040	,006	41,377	1	,000	,961
	PLACE	-1,217	,246	24,567	1	,000	,296
	P11	,121	,043	7,714	1	,005	1,128
	S12	,827	,368	5,041	1	,025	2,286
	CURRENT	,021	,005	20,803	1	,000	1,021
	S6	,377	,188	4,009	1	,045	1,457
	Constant	,647	,485	1,784	1	,182	1,911

a. Variable(s) entered on step 1: NEWBID_A, PLACE, P11, S12, CURRENT, S6.

MODEL 2

Logistic Regression

Table E.10 Case Processing Summary

Unweighted Cases [a]		N	Percent
Selected Cases	Included in Analysis	633	80,4
	Missing Cases	154	19,6
	Total	787	100,0
Unselected Cases		0	,0
Total		787	100,0

a. If weight is in effect, see classification table for the total number of cases.

Table E.11 Dependent Variable ncoding

Original Value	Internal Value
no	0
yes	1

Block 0: Beginning Block

Classification Table [a,b]

Observed			Predicted		
			=s18a; don't knows (n=16) recoded as zero bidders; protestbidders eruit gehaald (=missing)		Percentage Correct
			no	yes	
Step 0	=s18a; don't knows (n=16) recoded as zero bidders; protestbidders eruit gehaald (=missing)	no	0	148	,0
		yes	0	485	100,0
	Overall Percentage				76,6

a. Constant is included in the model.

b. The cut value is ,500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	1,187	,094	159,754	1	,000	3,277

Table E.12 Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	NEWBID_A	33,989	1	,000
		PLACE	18,070	1	,000
		P11	6,643	1	,010
		S12	4,009	1	,045
		S3	2,756	1	,097
		P12	1,904	1	,168
	Overall Statistics		74,958	6	,000

Block 1: Method = Enter

Table E.13 Omnibus Tests of Model Coefficient

		Chi-square	df	Sig.
Step 1	Step	75,351	6	,000
	Block	75,351	6	,000
	Model	75,351	6	,000

Table E.14 Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	613,146	,112	,169

Table E.15 Hosmer and Lemeshow Tes

Step	Chi-square	df	Sig.
1	8,120	8	,422

Table E.16 Contingency Table for Hosmer and Lemeshow Test

		=s18a; don't knows (n=16) recoded as zero bidders; protestbidders eruit gehaald (=missing) = no		=s18a; don't knows (n=16) recoded as zero bidders; protestbidders eruit gehaald (=missing) = yes		
		Observed	Expected	Observed	Expected	Total
Step 1	1	38	35,456	25	27,544	63
	2	24	24,556	40	39,444	64
	3	23	19,973	41	44,027	64
	4	9	16,263	54	46,737	63
	5	14	13,519	49	49,481	63
	6	10	10,680	52	51,320	62
	7	13	9,255	50	53,745	63
	8	6	7,899	57	55,101	63
	9	6	6,366	58	57,634	64
	10	5	4,034	59	59,966	64

Table E.17 Classification Table[a]

			Predicted		
			=s18a; don't knows (n=16) recoded as zero bidders; protestbidders eruit gehaald (=missing)		Percentage Correct
	Observed		no	yes	
Step 1	=s18a; don't knows (n=16) recoded as zero bidders; protestbidders eruit gehaald (=missing)	no	25	123	16,9
		yes	15	470	96,9
	Overall Percentage				78,2

a. The cut value is ,500

Table E.18 Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	NEWBID_A	-,012	,002	33,220	1	,000	,988
	PLACE	-1,080	,216	25,019	1	,000	,340
	P11	,126	,037	11,442	1	,001	1,134
	S12	,978	,349	7,834	1	,005	2,659
	S3	,427	,222	3,695	1	,055	1,532
	P12	-,345	,202	2,911	1	,088	,708
	Constant	,956	,427	5,001	1	,025	2,601

a. Variable(s) entered on step 1: NEWBID_A, PLACE, P11, S12, S3, P12.

CURRICULUM VITAE

Aylin TÜMAY was born in Kırklareli on Nov 6,1967. After graduated from Beşiktaş Atatürk High School, she got her B.S. in Environmental Engineering of the Istanbul Technical University and M.Sc. in the same department.

She started her career as the first environmental engineer in Environmental Department of Istanbul Chamber of Industry in 1991. At the same period, she got her Ph.D. proficiency exam. After passing that, she got a scholarship from Turkish Government ranked as the third in her colleagues. After she completed her research in US, she came back and joined to Sistem Yapı, one of the leader construction companies in environmental sector, as a proposal engineer in 1993. She worked in different departments as a project and also site engineer. For a while, she became the Manager of the Water Department established and developed in her responsibility. In that period, she managed and constructed very specific and chosen projects including water softening, demineralization and Reverse Osmosis plants to the clients like Arçelik, Şisecam and Zorlu Groups. She jointed to many seminars and conferences in Turkey and abroad. After reorganization of the Sistem Yapı, she was assigned as Business Development Manager in 1999.

She worked in Earth Tech Company /Turkey Branch one of the biggest Environmental Consulting Companies in US as a Marketing Coordinator, having a responsibility being in this sector as a well known US company between 2001-2003 years. From 2003 to now, she has worked as a free lance consultant in the environmental projects.

She speaks fluently English. She is married and has a daughter.