

I-CRAFT

RESEARCHES ON AGRICULTURE FOOD AND ENVIRONMENT

ISBN: 978-605-031-725-1

www.icraft-conference.com



From soil to bread



1ST. INTERNATIONAL CONFERENCE OF RESEARCH ON AGRICULTURAL AND FOOD TECHNOLOGIES

E-PROCEEDINGS

3-5 OCTOBER 2019 Sheraton/ADANA/Turkey

1ST. INTERNATIONAL CONFERENCE OF RESEARCH ON AGRICULTURAL AND FOOD TECHNOLOGIES

Editor: Dr. Tunahan ERDEM

ISBN: 978-605-031-725-1

Keywords: Agriculture, Food and Envireonment

We would like to express our special thanks to these who have enabled the conference been realized.



T.C. ADANA VALİLİĞİ

AOSB

Adana Hacı Sabancı Organize Sanayi Bölgesi





ORGANIZING COMMITTEE

Prof. Dr. Ahmet INCE (Chair)

Dr. Tunahan ERDEM (Conference Secretary)

Assoc. Prof. Dr. Sait M. SAY

Assoc. Prof. Dr. Cemal KURT

Assoc. Prof. Dr. Asiye AKYILDIZ

Prof. Dr. Hasan Hüseyin OZTURK

Research Assist. Mustafa SEHRI

Research Assist. Melih Çevik YAVUZ

PhD. Student Beyza OZTURK ERDEM

Dr. Pelin KELEŞ OZTURK

Eng. Gurkan YASAR

www.icraft-conference.com

SCIENTIFIC COMMITTEE

Prof. Dr. Serkan SELLI (Turkey)
Prof. Dr. Adamo ROMBOLA (Italy)
Assoc. Prof. Dr. Dritan TOPI (Albania)
Dr. Jurga BUDRENE (Lithvania)
Prof. Dr. Atılgan ATILGAN (Turkey)
Assoc. Prof. Dr. Jasur SAFUROV (Uzbekistan)
Prof. Dr. Muhammad Subhan QURESHI (Pakistan)
Dr. Nazir Ahmad KHAN (Pakistan)
Dr. Tahira ALI (Pakistan)
Prod. Dr Mohammed BOUAZIZ (Tunisia)
Prof. Dr. Şinasi AKDEMIR (Turkey)
Prof. Dr. Ali Musa BOZDOGAN (Turkey)
Prof. Dr. H. Hüseyin OZTURK (Turkey)
Prof. Dr. Hannu MIIKOLA (Finland)
Prof. Dr. George ADIR (Romania)
Prof. Dr. Noorullah SOOMRO (Pakistan)
Prof. Dr. İlker Hüseyin ÇELEN (Turkey)
Assoc. Prof. Dr.Alp Kağan Gurkan GURDIL (Turkey)
Assoc. Prof. Dr.Yeşim Benal OZTEKİN (Turkey)
Prof. Dr. Murat KACIRA (USA)
Prof. Dr. İsmail BOGREKCİ (Turkey)
Prof. Dr. Kamil SACILIK (Turkey)
Assoc. Prof. Dr. Caner KOC (Turkey)
Assoc. Prof. Dr. Faheem SHADZAD (Turkey)
Assoc. Prof. Dr. Kürşat CELİK (Turkey)
Prof. Dr. Can ERTEKİN (Turkey)
Prof. Dr. İsmail CELİK (Turkey)
Prof. Dr. Zeliha B. BARUT (Turkey)
Prof. Dr. Ebubekir ALTUNTAS (Turkey)
Assoc. Prof. Dr.Sefa ALTIKAT (Turkey)
Dr. Tevhide KIZILDENIZ (Turkey)
Prof. Dr. Serap GONCU (Turkey)
Prof. Dr. Kamil EKINCI (Turkey)

Prof. Dr. Yeşim Yalçın MENDI (Turkey)
Prof. Dr. Mustafa UNLU (Turkey)
Prof. Dr. Hakan OZKAN (Turkey)
Prof. Dr. Sarp K. SUMER (Turkey)
Assistant Prof. Dr. Ufuk GULTEKIN (Turkey)
Prof. Dr. Cengiz KAZAK (Turkey)
Prof. Dr. Mehmet TOPAKCI (Turkey)
Prof. Dr. Hamide GUBBUK (Turkey)
Assistant Prof. Dr. Murat TURGUT (Turkey)
Assoc. Prof. Dr. Aslıhan DEMIRDOVEN (Turkey)
Assistant Prof. Dr. Selçuk UGURLUAY (Turkey)
Assoc. Prof. Dr. Sevil KARAASLAN (Turkey)
Assoc. Prof. Dr. Cengiz KARACA (Turkey)
Prof. Dr. Şebnem ELLIALTIOĞLU (Turkey)
Prof. Dr. Nebahat SARI (Turkey)
Prof. Dr. Yıldız DASGAN (Turkey)
Prof. Dr. Soner KAZAZ (Turkey)
Assistant Prof. Dr. Ömer EREN (Turkey)
Prof. Dr. Uğur ZÜLKADIR (Turkey)
Assoc. Prof. Dr. İbrahim AYTEKIN (Turkey)
Assistant Prof. Dr. Bahadır DEMIREL (Turkey)
Assoc. Prof. Dr. Muharrem KARAASLAN (Turkey)
Assoc. Prof. Dr. Emin UNAL (Turkey)
Prof. Dr. Bahri BAYRAM(Turkey)
Assoc. Prof. Dr. Çağatay TANRIVERDI (Turkey)
Dr. Adel Zeggaf TAHIRI (Morocco)
Assoc. Prof. Dr. Ali UNLUKARA (Turkey)
Prof. Dr. Abid HASNAIN (Pakistan)
Assistant Prof. Dr. Zeynep SAHAN(Turkey)

CONTENTS

ORAL PRESENTATION VII

REVEALED COMPARATIVE ADVANTAGE AND COMPETITIVENESS OF TURKEY AGRICULTURAL MACHINERY SECTOR 1

THE IMPACT OF THE INTRODUCTION OF NORMS OF FERTILIZERS AND IRRIGATION ON THE CHANGE IN THE NUTRITIONAL REGIME OF THE SOIL IN MIXED CROPS OF BARLEY AND ALFALFA 2

THE EFFECTS OF ELEAGNUS ANGUSTIFOLIA ESSENTIAL OIL ON THE BACTERIOLYTIC ACTIVITY OF RUMINAL PROTOZOA 3

DETERMINATION OF TEMPERATURE-HUMIDITY INDEX (THI) VALUES IN THE MEDITERRANEAN REGION: A CASE OF DAIRY CATTLE BREEDING 4

DETERMINATION OF PHOSPHORUS AND POTASSIUM LEVELS IN GREENHOUSES: THE CASE OF FETHIYE REGION 5

INVESTIGATION OF HEATING AND COOLING DEGREE-HOUR VALUES IN GREENHOUSES WITH DIFFERENT COLOR COVER MATERIALS: THE CASE OF LETTUCE PLANT 6

ISOTOPIC APPROACH TO PLANT BASED ALCOHOL/METHANOL MIXTURES BY MEANS OF C13/C12 ANALYSIS 8

DETERMINATION OF THE FACTORS AFFECTING THE ADOPTION RATE OF PRECISION FARMING BY SWOT APPROACH 9

TITLE SESAME (SESAMUM INDICUM L) DIVERSITY IN TURKEY 10

SOME AGRONOMIC TRAITS AND YIELD POTANTIAL OF SESAME GENOTYPES FROM DIFFERENT ORIGIN 11

THE POTENTIAL OF AGRICULTURAL RESIDUES IN THE DISTRICTS OF ADANA 13

THE POTENTIAL OF BIOGAS PRODUCTION FROM ANIMAL MANURE AND GREENHOUSE GAS EMISSION REDUCTION IN THE DISTRICTS OF ADANA 14

RECENT CONCERN IN FRESH AND FRESH-CUT PRODUCE: THE FORMATION OF L. MONOCYTOGENES BASED BIOFILM 15

THE PRODUCTION OF BACTERIOCIN BY MICROORGANISMS USING WHEY AS A CULTURE MEDIUM 17

SOME THERMAL PROTECTION USED IN GREENHOUSES LIGHT AND RADIUM PERMEABILITY OF SHEET CURTAINS 19

DETERMINATION OF PLANT WATER STRESS BY REMOTE SENSING APPLICATIONS 20

DEGRADATION KINETICS OF ASCORBIC ACID IN LEMON JUICE AT DIFFERENT PASTEURIZATION CONDITIONS 21

MOLECULAR MARKERS IN PLANT BREEDING: KASP; A RECENT TOOL IN EFFICIENT WHEAT BREEDING. 23

A CASE STUDY ON PERFORMANCE EVALUATION OF THE IRRIGATION NETWORKS IN LOWER SAKARYA SUB-BASIN 25

CONVENTIONAL ANALYTICAL METHODS FOR DETERMINING MYCOTOXINS 27

PROPOSED MECHANISMS AND TRENDS IN THE FUTURE FOR PESTICIDE DEGRADATION 28

EFFECTS OF DIFFERENT TILLAGE SYSTEMS ON SUNFLOWER (HELIANTHUS ANNUUS L.) YIELD AND WEED DENSITY 30

THE EFFECT OF FOLIAR BORON (B) APPLICATIONS TO YIELD AND YIELD COMPONENTS OF SUNFLOWER (HELIANTHUS ANUUS L.) 31

THE INFLUENCE OF FOLIAR BORON (B) TREATMENTS TO YIELD AND YIELD COMPONENTS OF PEANUT (ARACHIS HYPOGAEA L). 32

DETERMINATION OF AROMA COMPOUNDS OF CV. ANTEP KARASI GRAPES 33

AROMA COMPOUNDS IN MOLASSES FROM JUNIPERUS *DRUPACEA L* 34

AROMA FORMATION IN FERMENTED MEAT PRODUCTS 35

DETERMINATION OF ENERGY USE EFFICIENCY AND AGRICULTURAL LIFE CYCLE ASSESSMENT OF SAFFRON (CROCUS SATIVUS L.) CROP PRODUCTION 36

SCREENING OF PHENOLIC CONTENT AND ANTIOXIDANT CAPACITY OF MANDARIN (CITRUS RETICULATA BLANCO) FRUITS EXTRACTED WITH VARIOUS SOLVENTS 38

LC-DAD-ESI-MS/MS-BASED PHENOLIC PROFILING OF ANTEP KARASI GRAPES AND THEIR ANTIOXIDANT ACTIVITY 39

LIVESTOCK WASTE MANAGEMENT IN TURKEY 41

CREATION of TURKEY's SOLAR EXERGY POTANTIAL ATLAS ($SExPA_{TR}$) 42

PROBIOTIC PROPERTIES OF FOODBORNE ENTEROCOCCI 44

ECONOMICAL EVALUATION TECHNIQUES FOR PRECISION SPRAYING 45

MEDICINAL ACTIONS AND HEALTH BENEFITS OF EGGPLANT 46

MEDICINAL AND NUTRITIONAL POTENTIAL OF BAUHINIA VARIEGATA 47

NEAR INFRARED SPECTROSCOPY AND MULTIVARIATE ANALYSES USED TO FAST AND NON-DESTRUCTIVE PREDICT CORN SEED GERMINATION 48

DEVELOPMENT OF AN INTEGRATED MODEL TO ASSESS THE IMPACT OF PRACTICES AND LAND USE ON AGRICULTURAL PRODUCTION IN MOROCCO UNDER CLIMATE STRESS, OVER THE NEXT TWENTY YEARS. 49

INVESTIGATION OF KNOWLEDGE LEVELS AND ENVIRONMENTAL SENSITIVITY ABOUT PESTICIDE USE OF FARMERS 50

HURDLE TECHNOLOGY ON BEE POLLEN 52

AN INNOVATIVE APPROACH TO ASSESS THE AUTHENTICITY AND ORIGIN OF FOOD PRODUCTS: STABLE ISOTOPE RATIO ANALYSIS 53

ESTABLISHMENT OF HAIRY ROOT LINES AND ANALYSIS OF TERPENOID INDOLE ALKALOIDS IN ORNAMENTAL AND MEDICINAL PLANT CATHARANTHUS ROSEUS 54

A REVIEW OF 3D PRINTERS AND MODELLING STEPS OF A RADIAL FAN BLOWER 56

MALTOSE AMOUNT OF HONEYS FROM TURKEY 57

METHODS FOR THE VALUATION OF ENVIROMENTAL GOODS AND SERVICES IN TURKEY 58

FUNCTIONAL AND DIGESTIBILITY CHARACTERISTICS OF CORN AND SORGHUM STARCH EXTRUDATES 59

EFFECTS OF CLIMATE CHANGE ON GRAPEVINES WATER STATUS AND YIELD QUALITY 60

DESIGN OF SMALL SCALE INFRARED DRYER 62

FUNCTIONAL PROPERTIES OF MODIFIED FOODS 63

ANTIOXIDANT AND ANTIMICROBIAL ACTIVITIES OF MYRTUS COMMUNIS ESSENTIAL OILS 64

TITLE INFLUENCE OF DROUGHT AND SALT STRESS REGIMES ON MORPHOLOGICAL, PHYSIOLOGICAL AND BIOCHEMICAL PARAMETERS IN ALLIUM CEPA L. 66

DESIGN FUNDAMENTALS OF AN EXPERİMENTAL PLATFORM FOR PEANUT YIELD MONITORING SYSTEM 67

POSTER PRESENTATION 69

CONTROL MANAGEMENT AND SYMPTOMS OF *TOMATO BROWN RUGOSE FRUIT VIRUS* (TOBRFV) ON TOMATO AND PEPPER CROPS 70

PREVALENCE OF COMMON RUST IN CUKUROVA REGION 71

IMPORTANT VIRUS DISEASES LIMITING THE PRODUCTION OF KAHRAMANMARAS RED PEPPER 72

CORKY ROOT ROT (PYRENOCHAETA LYCOPERSICI SCHNEIDER & GERLACH) DISEASE IN TOMATO CULTIVATION 73

FULL PAPERS 74

USE OF MOLECULAR MARKERS IN DISEASE RESISTANT VEGETABLE BREEDİNG 75

REVEALED COMPARATIVE ADVANTAGE AND COMPETITIVENESS OF TURKEY AGRICULTURAL MACHINERY SECTOR 83

DESIGN OF SMALL SCALE INFRARED DRYER 92

RECENT CONCERN IN FRESH AND FRESH-CUT PRODUCE: THE FORMATION OF *L. MONOCYTOGENES* BASED BIOFILM 98

THE PRODUCTION OF BACTERIOCIN BY MICROORGANISMS USING WHEY AS A CULTURE MEDIUM 104

A REVIEW OF 3D PRINTERS AND MODELLING STEPS OF A RADIAL FAN BLOWER 110

EFFECT OF PHOSPHORUS RATES ON YIELD AND QUALITY TRAITS OF WHEAT (TRITICUM AESTIVUM L.) 120

PROBIOTIC PROPERTIES OF FOODBORNE ENTEROCOCCI 124

THE POTENTIAL OF AGRICULTURAL RESIDUES IN THE DISTRICTS OF ADANA ... 129

THE POTENTIAL OF BIOGAS PRODUCTION FROM ANIMAL MANURE AND GREENHOUSE GAS EMISSION REDUCTION IN THE DISTRICTS OF ADANA 136

CONVENTIONAL ANALYTICAL METHODS FOR DETERMINING MYCOTOXINS 146

THE INFLUENCE OF FOLIAR BORON (B) TREATMENTS TO YIELD AND YIELD COMPONENTS OF PEANUT (ARACHISHYPOGAEA L.) 154

THE EFFECT OF FOLIAR BORON (B) APPLICATIONS TO YIELD AND YIELD COMPONENTS OF SUNFLOWER (*HELIANTHUS ANUUS* L.) 159

EFFECTS OF DIFFERENT TILLAGE SYSTEMS ON SUNFLOWER (HELIANTHUS ANNUUS L.) YIELD AND WEED DENSITY 164

DESIGN FUNDAMENTALS OF AN EXPERİMENTAL PLATFORM FOR PEANUT YIELD MONITORING SYSTEM 169

STEVIA: ŞEKERE ALTERNATİF DOĞAL VE SIFIR KALORİLİ TATLANDIRICI 175

PROPOSED MECHANISMS AND TRENDS IN THE FUTURE FOR PESTICIDE DEGRADATION 189

NITROGEN USE EFFICIENCY IN THE F6 GENERATION OF DIALLEL CROSS IN DURUM WHEAT 196

LIVESTOCK WASTE MANAGEMENT IN TURKEY 202

METHODS FOR THE VALUATION OF ENVIROMENTAL GOODS AND SERVICES IN TURKEY 211

INVESTIGATION OF KNOWLEDGE LEVELS AND ENVIRONMENTAL SENSITIVITY ABOUT PESTICIDE USE OF FARMERS 218

AROMA COMPOUNDS IN MOLASSES FROM *JUNIPERUS DRUPACEA* L. 226

AROMA FORMATION IN FERMENTED MEAT PRODUCTS 233

NEAR INFRARED REFLECTANCE SPECTROSCOPY AND MULTIVARIATE ANALYSES FOR FAST AND NON-DESTRUCTIVE PREDICTION OF CORN SEED GERMINATION 240

ORAL PRESENTATION

METHODS FOR THE VALUATION OF ENVIROMENTAL GOODS AND SERVICES IN TURKEY

Sinan DURU[1], Seyit HAYRAN[1] & Aykut GÜL[1]

[1] Department of Agricultural Economics, Faculty of Agriculture, University of Cukurova, 01380, Adana, Turkey

***Correspondence email:** s.duru85@hotmail.com

ABSTRACT

Until the 1980s, while environmental goods were considered unlimited and free goods, with the increasing population and globalization after the 1980s, it was accepted that the supply of environmental goods was between limited and scarce resources. Especially due to cause by environmental pollution agricultural decreased in production and social costs, for the sustainable use of environmental goods and services the valuation of environmental goods became compulsory. The valuation of environmental goods and services was started for the first time in the USA in the 1950s, valuation studies in Turkey were started at the end of the 1990s. The main purpose of the valuation of environmental goods and services is to determine the value of the benefit that will ensure the rational use for present and future generations of existing resources. The Economic value of the exchange of environmental goods and services, ex-ante and ex-post is calculated in two methods. In the valuation of environmental goods and services without monetary value difficult and insufficient of cost-benefit analysis, different methods have led to developments. These methods are divided into two as direct and indirect valuation methods. The indirect valuation method is consists of contingent valuation method; the direct valuation method is divided into two as travel cost method and hedonic pricing. In this study, the main direct and indirect methods used for the valuation of environmental goods and services were examined in Turkey.

Keywords: Environmental Goods and Services, Economic Valuation Methods, Natural Resources, Turkey.

ÖZET

Çevresel malların, 1980'li yıllara kadar sınırsız ve serbest mallar olduğu kabul edilmiş olup, 1980'li yıllardan sonra artan nüfus ve küreselleşmeyle birlikte çevresel mal arzının da sınırlı ve kıt kaynaklar arasında olduğu benimsenmiştir. Özellikle çevre kirliliğinin tarımsal üretimde neden olduğu azalma ve sosyal kayıplar nedeniyle çevresel mal ve hizmetlerin sürdürülebilir kullanımı için çevresel malların değerlemesi zorunlu hale gelmiştir. Çevresel mal ve hizmetlerin değerleme yöntem çalışmaları ilk kez 1950'li yıllarda ABD'de başlamış olup, Türkiye'de değerleme çalışmaları 90'lı yılların sonunda başlamıştır. Çevresel mal ve hizmetlerin değerlemesindeki temel amaç var olan kaynakların şimdiki ve gelecek kuşaklara rasyonel kullanımını sağlayacak fayda değerinin belirlemektir. Çevresel mal ve hizmetlerin değişiminin ekonomik değeri, olay öncesi (ex-ante) ve olay sonrası (ex-post) olmak üzere iki şekilde hesaplanmaktadır. Parasal olarak değeri olmayan çevresel mal ve hizmetlerin değerlemesinde fayda-maliyet analizinin zor ve yetersiz olması, farklı yöntemleri geliştirilmesine neden olmuştur. Bu yöntemler doğrudan ve dolaylı değerleme yöntemi olmak üzere ikiye ayrılmaktadır. Dolaylı değerleme yöntemi, koşullu değerleme yönteminden oluşurken, doğrudan değerleme yöntemi ise seyahat maliyet

yöntemi ve hedonik fiyatlandırma olmak üzere ikiye ayrılmaktadır. Bu çalışmada, Türkiye'de çevresel mal ve hizmetlerin değerlemesinde uygulanan doğrudan ve dolaylı yöntemleri incelenmiştir.

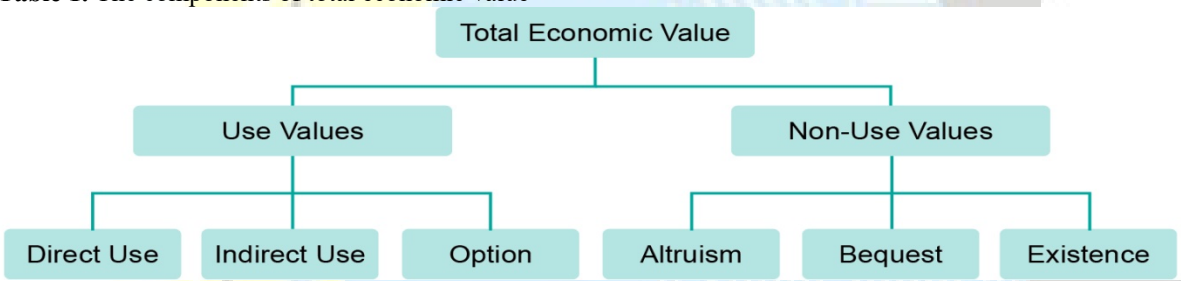
Anahtar Kelimeler: Çevresel Mal ve Hizmetler, Doğal Kaynaklar, Ekonomik Değerleme Yöntemleri, Türkiye

1.INTRODUCTION

Environmental goods were unlimited until the 1980s and accepted as free goods. However, with the increasing population after the 1980s, environmental goods supply was accepted to limited and they are adopted to be among the scarce resources. For the sustainable use of environmental goods, the valuation of environmental goods is mandatory.

The valuation of environmental goods is consisting of depending on the effects of economic value on environmental product, service or environmental quality change. The total economic value of the natural resources is divided into two as usage value and non-use value (Table 1). While the use-value is divided into three as direct use, indirect use and option value, non-useable value is divided into 3 as altruism, bequest, and existence value (Brander and Crossman, 2017).

Table 1. The components of total economic value



Source: Brander and Crossman, 2017

The valuation method studies of natural resources first time were started in the USA in the 1950s and the studies in Turkey were started at the end of the 90s. The valuation method studies of natural resources are carried out in the Faculty of Forestry, Landscape Architecture and Agricultural Economics departments (Gündoğmuş & Kalfa, 2016). The main purpose of the valuation of natural resources is to determine the value of the benefit that will ensure the rational use of existing resources (Pehlivanoğlu, 2010).

The economic value of environmental change is calculated in two ways: pre-event (ex-ante) and pot-event (ex-post). Ex-ante is a possible economic impact analysis for precautionary or pollution reduction alternatives, ex-post is the assessment of economic damage after any environmental pollution.

In this study have been compiled studies previously conducted in Turkey on the valuation of environmental goods, methods related to the evaluation of environmental goods are tried to be explained with made studies.

2. ASSESSMENT METHODS

2.1. Indirect valuation method

The indirect valuation method is based on monitoring the course of economic indicators with determining the value expressed by them in terms of different environmental factors. The indirect approach tries to determine the value of associate on goods and services on the market with environmental goods and services (Tümay & Gönenç, 2006). The resources in the ecosystem with a function such as water treatment, erosion protection, and carbon retention is found the value of goods on associating with the indirect use of functional benefits (Gündoğmuş & Kalfa, 2016). The most commonly used method of

indirect appraisal method is the conditional valuation method and the determined preference method is also used (Talay et al., 2010).

2.1.1. Conditional valuation method

Conditional Valuation Method is used to consist of the answers given by hypothetical questions with a certain scenario for the analysis of the value measures that are not obtained from the selection observations of individuals and is the measurement of the value of depending on public space character of the answers (Belkayalı & Akpınar, 2009). These questions include how much they will pay for a particular benefit or how much they will agree to pay by participating in a certain expense (Talay et al., 2010). The conditional valuation method is survey work based on methods such as hedonic wages and human capital.

The conditional valuation method arose due to begin to threaten environmental problems in human health and life. Conditional valuation method was first introduced determined by conditional valuation after a meeting with hunters to determine the non-market value of the Maine forest by a Rob Davis in Ph.D. at Harvard University in 1963 (Gündoğmuş & Kalfa, 2016).

Conditional valuation methods consist of five phases to creating a corporate market, collection of data, determination of average pay value, estimation of pay value function and calculation of total value (Mancı, 2017). The conditional evaluation method is divided into 4 categories to price bidding game, payment card, open-ended question, and closed-ended question. The conditional valuation method has been criticized due to strategic bias, informatics bias, starting point bias, hypothetical bias, and inequality observed between willingness to pay and willingness to accept (Gündoğmuş & Kalfa, 2016). The existence of subjectivity with these judgments raises questions about the validity and reliability of the method and some countries such as the USA and England are limited to use (Kaya et al., 2009).

Table 2. Conditional valuation method studies in Turkey

Studies	Area	Results
Pak & Türker (2004)	Kapiçam Forest Resting Place-Kahramanmaraş	42,000,00 tl/year
Gürlük & Rehber (2009)	Manyas Lake-Balıkesir	4,800,000.00 tl/year
Kaya et al. (2009)	Bartın	Wild life
Pehlivanoğlu (2010)	Bartın Stream	57.58 tl/one person
Mancı (2017)	Harran Ruins-Şanlıurfa	125.900 $
Yılmaz & Koç (2018)	Beydağları Coast National Park-Antalya	188,228,775.00 tl total

In our country, some studies have been done by applying the conditional valuation method (Table 2). In the studies of Pak & Türker (2004), the willingness to pay of visitors in Kapiçam forest resting place in Kahramanmaraş was measured by using the conditional valuation method, determined that the tendency to pay entrance fee will increase in line with developments in the forest area. In the studies of Gürlük & Rehber (2009) environmental assessment of Lake Manyas was carried out by survey method using the conditional method assessment, calculated the desire to pay per person and total for the sustainability of the lake in the long run. In the studies of Kaya et al. (2009), in Bartın province the scenario and map containing the institutional protection and improvement project were prepared by determining the conditional valuation method for wildlife protection and hunting. In the study of Mancı (2017), the economic value of the Harran Ruins was realized by survey using on conditional valuation method, demographic characteristics, cost, and frequency of visits, bid price and where they came from have emerged as factors affecting willingness to pay. In the studies of Yılmaz & Koç (2018) the recreational value of Beydağları Coastal National Park with its non-market non-use value was ascertained to 6 times benefit on according to the cost spent by the visitors of the park measured by conditional valuation method.

The conditional valuation method usually involves time-consuming implementation, misconceptions about using the specified preference instead of the resulting preferences, and other misconceptions with

survey design and implementation (Kirkpatrick, 2005). In addition, the conditional valuation, because the method is a virtual preference method, in the economic valuation method, is included in unused values class (Özkok et al., 2019).

2.2. Direct valuation method

Direct valuation method avoids a potential market assumption and one-to-one communication with consumers and through the survey is based on expressing the preference of environmental goods (Belkayalı & Akpınar, 2009). The direct valuation method is based on willingness to voluntary payment by consumers to protect the quality of the environment and is also called conditional valuation (Bal, 2015).

The direct valuation method is divided into two as the travel cost method and the hedonic pricing method.

2.2.1. Travel cost method

The travel cost method is the method used to determine in values to use of recreation areas such as lakes, rivers, and forests. Even if the cost of travel method was first put forward by Harold Hoteling in the USA in the 1930s to the National Parks Service for the Recreational Value of National Parks experimentally Clawson pioneered in 1959 and 1966 (Bateman, 1993). The travel cost method was developed from the Gravity model, which one of the demand forecasting methods (Mancı, 2017).

The travel cost method is to measure the economic benefits of recreation areas and against the cost of new recreation areas is found economic efficiency by comparing externalities. Measurement of the new economic value depending on the level of benefit of a change in the quality of recreation areas and it is measured and compared with each other homogeneous recreation services although different environmental has quality qualities, it is provided by measuring and comparing areas with homogeneous (Alkay & Ocakçı, 2003).

The travel cost method is applied in two ways as individual and regional and it is divided into being 3 as changing the parameter, hedonic travel cost and random benefit model (Gündoğmuş & Kalfa, 2016; Özkok et al., 2019). The objective of two different approaches, individual and regional, is to define to demand function obtain to consumer demand curves and to estimate the measure of consumer surplus by calculating the total benefit generated by visitors (Külekçi & Dönmez, 2014).

The steps in determining the net economic value of the recreation area according to the cost of travel method is consist of determination of the factors affecting the demand for recreation area and the establishment of the model, data collection, determination of the type of demand function, regression analysis and determination of the first stage demand curve, the determination of the second stage demand curve with the hypothetical variables reflecting the recreation or travel cost, and the calculation of the consumer surplus and net economic value (Deniz, 2012).

The travel cost method is based on consumer behavior. In the travel cost method, the values to be determined by individuals who do not use natural and environmental resources as an action may not be estimated. (Belkayalı & Akpınar, 2009). The cost of travel method is the reflection of the total expenditure of the individual from the place, for the arrival of residence to the recreation area as money. (Talay et al., 2010). In this method, the cost travel of a person will be calculated to different as the cost of travel comes from different points to see the natural resource.

Table 3. Travel cost methods studies in Turkey

Studies	Araea	Results (Consumer Surplus)
Kaya et al. (2000)	Soğuksu Nation Park-Ankara	134,570.00 tl/one person
Belkayalı and Akpınar (2009)	Yalova Hot Springs	1,239,014,400.00 tl/year
Külekçi and Dönmez (2014)	Uzungol Natural Park-Trabzon	101,322,000,00 tl/year
Karakuş and Aksoy (2016)	Nemrut Mountain Natural Park-Adıyaman	177.14 tl/one person

Kalfa (2018)	Pamukkale Natural Preservation Area	71,149,199,305,00 tl (Total)
Kaya et al. (2018)	Ankara Forests	503,00 tl/one person
Özkök et al. (2019)	Kaz Mountains-Edremit/Balıkesir	384,958,445.95 tl total

In our country, some studies have been done by applying to the travel cost method (Table 3). Kaya (2000) determined the economic value of the recreational area of Soğuksu National Park in Kızılcahamam district of Ankara by using the travel cost method, this method is come up passive use-value is lower than active use-value. Belkayalı & Akpınar (2009) conducted a survey to measure the economic value of the thermal and touristic use of the Thermal Spas in Yalova by the travel cost method and determined the consumer annuity value. Külekçi & Dönmez (2014) conducted a survey to measure the economic value of Trabzon Uzungöl Nature National Park by using with travel cost method and are increased of number visitors on demographic features such as having social security, being a male, owning the house. Karakuş & Aksoy (2016) conducted a survey to measure the economic value of Mount Nemrut National Park by using the travel cost method; consumer surplus was calculated by accepting variables demographic and social characteristics with annual visits number. Kalfa (2018) conducted a questionnaire in Pamukkale Natural Preservation Area to determine the economic value for recreational purposes by means of travel cost method and according to the results obtained, the ratio of the highest estimated economic value was found to be 1778 times higher annual gross income. In the study of Kaya et al. (2018) measured to forest areas in Ankara with the help of recreational demand function with travel cost method and stated that 503,00 TL increase in travel cost reduced the number of visitors by 1/3. Özkok et al. (2018) conducted by using the travel cost method survey for the measure of economic value tourism resources of Kaz Mountains in Erdemit district of Balıkesir and calculated annual individual consumer surplus and total consumer annuity cost by using regression analysis method.

2.2.2. Hedonic pricing method

The hedonic pricing method is based on the assumption that the price of the product varies depending on the environmental characteristics, as it is used to measure the cost of natural resources and environmental quality (Talay et al.,2010). The basis of hedonic pricing is based on measuring on level of exposure of goods and services price affected by different environmental conditions. Hedonic pricing determines the ratio of environmental impacts between the factors that make up the price of an asset by separating the contribution of environmental qualities among the components that make up the price in environmental valuation (Gündoğmuş & Kalfa, 2016).

The hedonic pricing method is first introduced for agricultural land pricing by G.C. Haas in 1922. Hedonic price modeling is developed for non-homogeneous goods with different properties (Mancı, 2017). Hedonic pricing is widely used in environmental benefit-cost analysis on sound and air pollution in urban areas (Tümay & Gönenç, 2006). The hedonic price is determined by summing the price of different properties of environmental goods. The quality characteristics of a product that can be exchanged with market price relationships are called the hedonic price function (Bal, 2015).

Table 4. Hedonic pricing methods studies in Turkey

Studies	Area	Results
Çoşar & Engindeniz (2013)	Agricultural Land/Menemen-İzmir	18,286.86 tl/da (income method) 10,753.72 tl/da (market method)
Akkılıç & Çetintaş (2014)	Thermal Tourism Enterprises-Balıkesir	63% again to visit
Kaya & Özyürek (2015)	METU Forest- Ankara	15,535-23,315 tl/one house
Öztürk et al. (2017)	Irrigable Agricultural Land/İzmir	11,941.78 tl/da (income method) 10,313.13 tl/da (market method)

In our country, studies with the hedonic pricing methods are generally for the housing market to conducted, studies related to the valuation of environmental goods are less than the other valuation methods (Table 4). Çoşar & Engindeniz (2013) The market value of the parcel was measured by the hedonic pricing method for irrigated farmland in the Menemen district in İzmir province, the most positive variable affecting this value was the outbuildings in the parcel. Akkılıç & Çetintaş (2014) conducted a survey on the hedonic consumption trend in thermal tourism enterprises in Balıkesir and 63% of the visitors re-visit stated that they visited again. Kaya & Özyürek (2015) determined the economic value of the METU forest landscape in Ankara by hedonic pricing, determined that the landscape is a desirable feature. Öztürk et al. (2017) The market value of irrigable agricultural land in İzmir was measured by hedonic pricing method, the variables that affected the market value the most were the productivity, quality, operation, saving the style, alternation of the parcel and proximity to the village center.

As criterion on the Hedonic pricing method is seen to disadvantages of the method on use of only value, assuming that market value is the value of environmental good and separating the effect of environmental factors on property prices from the effect of other explanatory variables (Kilpatrick, 2011).

3. CONCLUSIONS

The scarce resources of environmental goods and services have shown an economic value. Increasing the valuation of environmental goods will contribute to future generations to use these resources in a sustainable manner. Since there is more than one institution in the area of responsibility for environmental goods, they should establish rules for the valuation and sustainability of environmental goods and support scientific studies to be conducted.

REFERENCES

Akkılıç ME & H Çetintaş. 2014. The Determination of the Effect on Behavioral Intentions of The Hedonic and Utilitarian Consumption Tendencies in the Thermal Tourism Business. *International Review of Economics and Management*, 3(2): 123-142.

Alkay E & M Ocakçı. 2003. Comparison of Valuation Methods That Can Be Used Measurement of the Economic Values of Urban Green Areas, *İtüdergisi/a Mimarlık, Planlama, Tasarım*, 2(1):60-68.

Bal T. 2015. Agricultural Economics and Management. Natural Resources Economics and Management. *Süleyman Demirel University. Agricultural Facult, Department of Agricultural Economics.*

Bateman İ. 1993. Evaluation of the Environment: A Survey of Revealed Preference Techniques. *CSERGE Working Paper*, Norwich.

Belkayalı N & N Akpınar. 2009. Determination of the Economic Value of Recreational and Tourism Use Value of the Yalova Thermal Spring Via Travel Cost Method**.** *Turkish Journal of Geographical Sciences*, 7(2): 177-184.

Brander LM & N Crossman. 2017. Economic Quantification. *Mapping Ecosystem Services*, 113.

Çoşar G & S Engindeniz. 2013. Hedonic Analysis of Agricultural Land Values: The Case of Menemen, İzmir. *Journal of Agriculture Faculty of Ege University*, 50(3): 241-250.

Deniz T. 2012. Valuation Analysis in Erosion Control Activities. *İstanbul University Institute of Science, Phd Thesis*, 218p. Istanbul

Gündoğmuş ME & VR Kalfa. 2016. Determination of Economic Value of Assets with Non-Market Value. *Journal of Life Economics*, 2016(10):177-200.

Gürlük S & E Rehber. 2009. A Study on Environmental Valuation of the Lake Manyas. *Turkish Journal of Agricultural Economics*, 15(1): 9-15.

İnan İH. 2016. Agricultural Economics and Management. *Ideal Culture Publishing*, İstanbul, 404p.

Kalfa VR. 2018**.** Appreciation of Economic Value of Natural Resources For Recreational Purpose: A Case Study on Pamukkale Natural Preservation Area. *Adnan Menderes University Department of Business Administration PhD Thesis*, Aydın.

Karakuş Ü & A Aksoy. 2016. Determining the Economic Value of Benefiting from Adıyaman Nemrut Mountain National Park for Recreational and Travel Purposes: Travel Costs Application*. Journal of the Faculty of Agriculture*, 47(1): 45-51.

Kaya G, Y Yıldız, Z Şaltu, F Yaman & İ Ateşoğlu. 2009. A Suggestion For Overcoming Information Constraint in Contingent Valuation Studies: A Case Study of Economic Valuation of Wildlife Resources. *Journal of Bartin Faculty of Forestry*, 11(16): 45-59.

Kaya G & E Özyürek. 2015. Economic Value Estimation of Scenic Beauty of METU Forest in the Context of Urban Forest. *Journal of Forestry Research*, 1(2): 15-28.

Kaya G, T Porsuk & M Çetiner. 2018. Estimating Regional Recreational Demand for Forest Recreation Sites with Travel Cost Method in Ankara Province. *Journal of Forestry Research*, 5(1): 15-30.

Kilpatrick C. 2010**.** Experts Systems and Mass Appraisal. *Journal of Property Investment & Finance*, 29(4-5): 529-550.

Külekçi M & R Dönmez. 2014. Determining the Economic Value of Benefiting from Trabzon Uzungöl Nature Park for Recreational and Travel Purposes: Travel Costs Application. *Ataturk University Journal of the Agricultural Faculty*, 45(1): 1-7.

Mancı AR, 2017. A Study on the Estimation of Entrance Fee and Economic Value of the Harran Ruins. *Elektronic Journal of Social Sciences*, 16(60): 288-303.

Özkök F, ŞO Mercan, HM Yıldırım, H Korkmaz, S Sünnetçioğlu & Ç Ayhan**.** 2019. Determination of Economical Value of Ida Mountains Tourism by the Travel Cost Method. *Electronic Journal of Social Sciences*, 18(69): 412-424.

Öztürk G, S Engindeniz & ÖV Bayraktar. 2017. Analysis of Factors Effect on Irrigated Agricultural Land Values in Izmir. *Selcuk Journal of Agriculture and Food Sciences*, 31(3): 75-87.

Pak M & MF Türker. 2004. Estimating the Recreational Use Value of Forest Resources by Using Contingent Valuation Method (Kapıçam Forest Recreation Sample). *KSU Journal of Science and Engineering*, 7(1):59-65.

Pehlivanoğlu N. 2010. Economic Valuation of Maintaining Water Quality in Bartın River. Bartın University Graduate School of Natural and Applied Sciences. *Department of Forest Engineering M.Sc. Thesis*, 99p. Bartin.

Talay İ, Akpınar N & N Belkayalı. 2010**.** Determination of Natural Resources Economic Value Due to Recreational and Tourism Use Purpose: Göreme Historical Natural Park. *Turkish Journal of Geographical Sciences*, 8(2): 137-146.

Tümay A & İE Gönenç. 2006. Benefit Analysis: An Application of the Contingent Valuation Method (CVM) in Köyceğiz – Dalyan Watershed. *İtüdergisi/d Mühendislik*, 5(3):23-29.

Yılmaz F & AA Koç. 2018. Determination of The Economic Value of The Beydağları National Park Using Travel Cost and Contingent Valuation Methods. *Mediterranean University Journal of Economics and Administrative Sciences*, 18(38): 1-22.