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Abstract
The present study tries to improve our understanding of why some people value coastal zone using attitudinal and preference factors in a Contingent Valuation Method (CVM) study. Specifically, it aims at public preferences for improving the quality (protection) of Pagasitikos coastal area in Greece and explores the influence of environmental attitude on preference to people's willingness to pay (WTP) coastal zone conservation. It also presents the results of a discrete CVM survey which investigates households' WTP for a set of wetland attributes. The proposed approach uses applied methodological methods like Principal Components and Cluster Analyses together with logistic regression. Various demographic variables (as education and income) together with people's preferences for coastal zone show a strong impact on WTP and the specific amounts stated. At a second stage people who accept the CVM scenario results and grouped into two segments, with different attitude against coastal zone management and ecological view.

Keywords: Environnemental attitudes; NEP scale; CVM; WTP; coastal zone people perception.

JEL classifications: C10; C52; Q20; Q51; Q57.

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1. Introduction

Coastal zone is a very important area source because it provides a significant number of products and services with high economic values while people live, work and recreate there (Costanza *et al*. 1997; Ledoux and Turner 2002). On the other hand, the water quality reduction and people's activities on coastal zone have as a result the loss of marine biodiversity, habitats and other services provided by marine and coastal zones (Halkos 2011a,b; Halkos and Jones 2012). Nowadays marine policies need the use of cost benefit analysis and by extension environmental valuation (Hanley *et al.* 2015). For the purpose of effective management of coastal and marine resources, it is essential to integrate the total economic value of those resources to decision-making processes (Birol *et al.* 2006).

Over the years a significant number of studies are interested in people's willingness to pay (hereafter WTP) for coastal zone ecosystem services. The natural ecosystem services valuation handle the problems of a better understanding of socio-ecological system complexity (Luisetti *et al.* 2014). Therefore, research on coastal zone valuation many times focuses on people's preferences towards its utility and as a way to manage environmental and development issues to attain sustainable development (Tran *et al.* 2002).

The Contingent Valuation Method (hereafter CVM) is based on individual preferences aiming to maximize their utility under their income constraint or to reduce their expenditures underlying a utility constraint (Spash 2006). With the years the use in CVM models of psychological or attitudes variables was considered essential if we want to improve results' quality (Harris et al. 1989; Mitchell and Carson 1989; Ndebelea and Forgiec 2017). As a consequence, CVM studies were designed in the framework of attitude-behavior relationships (Bernath and Roschewitz 2008).

The goal of our study is to measure the strength of people's preference and environmental attitude in terms of their WTP for coastal zone quality improvement. Specifically, it is explored if environmental attitudes are a significant motive for the behavioral intention of WTP and how people's preferences, opinions, and knowledge influence their behavior. In these lines, the causal method is considered at the parameter level and the effect of individuals' attitude against the coastal zone utility on the causal method is clarified.

Our research addresses several questions like whether there is a significant NEP scale–WTP relationship and whether the impact of differing demographic and socio-economic people's characteristics are important in a CVM study. The association between NEP scale and WTP has been proved in the literature, however, there are studies claiming that this relationship may not be important. Despite trying to calculate an economic value for the coastal area we do not have this as a goal, but to analyze the public preferences revealed through CVM responses. Then we try to segment respondents who said yes to CVM scenario into their respective preference groups based on individuals' motives to pay for coastal zone quality improvement.

Our study also contributes to existing knowledge in a number of ways. First, the findings contribute to the debate for the relationship between environmental attitudes and WTP and if NEP scale is an explanatory factor of this. We explore if the differences in attitudes for coastal zone utility can be accounted simultaneously with their underlying preferences. Secondly, it extends the ecosystem services valuation literature available regionally and internationally. Our results give a useful tool to decision makers and government agencies to plan possible coastal management programs for sustainable development of the coastal zone. Thirdly, our conclusions

contribute to discussions about motives behind people's decision to value economically natural ecosystems.

The structure of the paper is as follows. Section 2 reviews the existing relevant literature while section 3 introduces the study area, the valuation approach, the attitudinal questions and the survey process. Section 4 presents the results of WTP analysis and the multi-criteria analysis for having a better view of people's preferences. Section 5 discusses and presents the management implications of the empirical findings with the last section concluding the paper.

2. Relevant literature examining public attitudes to ecosystem's valuation

CVM studies are faced with the problem of population heterogeneity in characteristics and preferences (Choi and Fielding 2013) with the reliability of CVM studies' results depending on how researchers manage this heterogeneity (Hensher *et al.* 2005; Louviere 2001) using a variety of explanatory variables. The main categories of these variables are socio-demographic and attitudinal characteristics (Choi and Fielding 2013). Therefore attitudinal questions and psychometric measures are used into valuation models (Boxall and Adamowicz 2002; Brown et al. 1996; Cooper et al. 2004; Hanley and Craig 1991; Kahneman et al. 1993; Kotchen and Reiling 2000; Stern *et al.* 1995; Halkos and Matsiori 2012; Dietz *et al.* 2005; Hoyos *et al.* 2015).

According to the literature attitudes and beliefs influence people in paying (or not) for protecting the environment (Franco and Luiselli 2014; Johnson *et al.* 2004; Pouta 2004; Spash 2000; Stern and Dietz 1994). Bartczak (2015) reveals that the greater part of the literature on non-economic motives of WTP for environmental protection focuses on individual attitudes to the environment. Several studies are

interested in this relationship (among others Aldrich *et al.* 2007; Cooper *et al.* 2004; Kang et al. 2012; Kotchen and Reiling 2000; Meyerhoff 2006).

The need for this research is that people's attitudes should influence their behavior in the frame of a CVM study revealing unobserved preference heterogeneity (McFadden and Train, 2000). Attitude questions are used for segmentation of participants to the survey (Halkos and Matsiori 2012, 2016; Choi 2011; Morey *et al.* 2006; Scarpa and Menzel 2005; Winter 2005) or as explanatory variables of economic models (Ben-Akiva *et al.* 1999; Boxall and Adamowicz, 2002; Vredin Johansson *et al.* 2006). On the other hand, there are many attempts to investigate the importance of knowledge and familiarity in affecting people's WTP for protection (Ackerberg 2003; Wilson and Tisdell 2005; Tisdell and Wilson 2007; LaRiviere *et al.* 2014)

A very famous and most widely used measure (Dunlap 2008) of people's relationship between humans and the environment is the New Ecological Paradigm (NEP scale) which was developed by Dunlap *et al.* (2000). NEP scale was used as an explanatory variable and predictor of mean WTP in many studies which estimate the economic value of natural ecosystems. For instance, Kotchen and Reiling (2000) and Aldrich *et al.* (2007) accounted an important part of environmental attitudes (measured by NEP scores) as a determinant of mean WTP estimates for the endangered species protection. NEP scale also has been used in many surveys for economic valuation of water resources quality improvement (Cooper *et al.* 2004; Halkos and Matsiori 2012).

There are many studies using public surveys to explore public attitudes, preferences and awareness to coastal zone protection (Whitmarsh *et al.* 2009; Brody *et al.* 2008). According to Campos *et al.* (2012) anthropologists develop the study of

human environmental perceptions providing a tool for protecting and rationally managing the environment.

Several coastal zones researchers focused in economic value of coastal recreation through (Beharry-Borg *et al.* 2009): a) quality changes of area's characteristics which are not connected to water quality (Silberman and Klock 1988; Parsons *et al.* 2000; Hanley *et al.* 2003; Landry *et al.* 2003; Ostberg *et al.* 2012) and b) changes connected to water quality (Vaughn *et al.* 1985; Bockstael *et al.* 1987; McGonagle and Swallow 2005; Petrolia and Kim 2009; Voke *et al.* 2013).

A part of researches was conducted in tourist areas aiming to investigate preferences for beach use with samples consisted of residents and visitors of the area (Beharry-Borg and Scarpa 2010; Hess and Beharry-Borg 2012; Nunes and Van Den Bergh 2004; Halkos and Matsiori 2012; Zhang et al. 2015). On the other hand, there are studies focused only to non-residents users of the coastal zone (Cook 2000; Blakemore and Williams, 2008; Castaño- Isaza *et al*. 2015; Jones *et al.* 2011). Finally, there are studies focusing on the deferential behavior between residence and those that travelled to visit the site (Prayaga 2017).

In Greece, to our knowledge, there is not significant number of previous studies measuring benefits associated with people's preferences and environmental attitudes and their WTP for coastal zone quality improvement. Some studies focusing on economic valuation of coastal zones are those of Jones *et al.* (2008), Organtzi *et al.* (2009) and Halkos and Matsiori (2012).

3. Study area and survey design

A CVM survey was carried out to residents of Volos city. Volos is a coastal port city in Thessaly located in the middle of the Greek mainland along the Pagasitikos Gulf. The lengthy (56 km) coastline of Volos offers attractive seaside secure for swimming with high quality of waters. On the contrary, Volos port is the third commercial port of Greece with human activities causing serious environmental problems. For these reasons sometimes the conflict uses of coastal zone makes necessary the economic valuation of those and the decision for the management of the area in the frame of a cost-benefit analysis. Halkos and Matsiori (2012) attempted to understand the motivations behind WTP for Pagasitikos coastal quality, including an individual's perceived importance of environmental protection

Our primary research was carried out on a total sample of 400 randomly selected people. The survey was designed according to the principles of a CVM survey with the sample chosen randomly with personal interviews and using a questionnaire designed and tested according to guidelines established by the NOAA panel (Arrow et al. 1993). With the help of a hypothetical market, respondents expressed their WTP to improve quality of the coastal zone for recreational use.

The structure of the hypothetical market included three elements: (1) A brief description of the measures that should be taken to improve the quality of coastal zone for recreational use, within a hypothetical protection program to avoid ecosystem degradation (loss of recreational goods and services provided by the coastal area); (2) the vehicle and payment conditions (frequency of payment); (3) the WTP question which was a dichotomous choice. Before the WTP question respondents were asked whether they were interested in participating in a program for coastal zone

improvement, which would be taken by the state. Participation in this program will cost them a specified amount of money (in €) in a one-time payment.

In the subsequent stage, WTP was obtained only from people who had responded positively in the first question. Now respondents were asked if they were willing to pay a particular quantity of money to verify their involvement. The amounts proposed were randomly fluctuated within the sample of respondents and ranged from 1 to 55 € (with €5 step). The bid step amounts were specified with the help of other research which was carried out by the authors in the area and was tried to investigate people's WTP for incorporation of certain costs in "Blue Flags" program (Halkos & Matsiori 2012). Knowing this information, respondents were asked if they would choose "yes" or "no" to endorse this effort. Follow-up questions were asked to establish causes for respondents' answer. As protest responses were taken these declining some features of the hypothetical CVM scenario. Then, for those not agreed to participate in the above program by paying a sum of money, the questionnaire included questions which were designed to investigate the reasons for this behavior.

Follow-up questions tried to figure reasons for respondents' answers. Respondents who choose not to pay the proposed amount were asked if they were willing to pay another amount. Similarly respondents who gave us an idea about a value were asked to rate several reasons associated with tourism development and protection of coastal zone and marine biodiversity.

Respondents' environmental attitude was measured with the help of NEP scale. NEP scale is an improved version of an older scale used to investigate people's ecological attitudes (Dunlap & Van Liere 1978). NEP scale was designed by Dunlap et al. (2000) and attempts to explore people's attitudes and perceptions with the help of a set of 15 questions. The 15 topics are grouped based on five factors: "Reality of

limits to growth", "Antianthropocentrism", "Fragility of nature's balance", "Rejection of exceptionalism", and "Possibility of an ecocrisis".

4. Empirical results

4.1. Sample socioeconomic and ecological profile

Table 1 illustrates the descriptive statistics of respondents' socioeconomic characteristics.[3] Means percentage distributions for NEP responses in the survey is shown in Table 2.

Table 1: Descriptive statistics of respondents' basic socioeconomic characteristics

	Number of observations	Mean/ Percentage	Standard Deviation
Gender (%)	400	52.0 % (Female)	-
Age (years)	400	39.923	15.76
Education level (years)	400	13.60	2.43
Mean monthly income (€)	363	885.53	654.861
Employment (%) Private sector Public sector Housework Students Unemployed Retired	400	 33.8 15.2 3.0 17.7 16.4 12.9	
Marital Status	400	49.0% (Single)	-

[3] The sample characteristics are representative of Volos' city population as they are similar to the census data of The Hellenic Statistical Authority (mean age: 43.3 years, gender: 48.4 % men and 51.4 women, family status: 55.2 married, education: 44.3% secondary school and mean (yearly) income 14.602 (www.elsta.gr).

Table 2: Mean percentage distributions and item–total correlations for New Ecological Paradigm (NEP) scale items*

NEP scale	Scale items	Responses (%)					Mean	Mean	SD	r_{i-t}
		STD	SWD	U	SWA	STA				
Reality of limits to growth	We are approaching the limit of the number of people the earth can support	10.7	15.9	**31.6**	24.4	17.4	10.18	3.2	1.2	0.191
	The earth has plenty of natural resources if we just learn how to develop them	6.7	6.0	12.4	21.9	**53.0**		4.1	1.2	0.228
	The earth has only limited room and resources	19.2	20.6	**27.6**	18.2	14.4		2.9	1.3	0.159
Antianthro-pocentrism	Humans have a right to modify the natural environment to suit their needs	22.4	26.4	**30.3**	11.7	9.2	8.91	2.6	1.,2	0.068
	Humans were meant to rule over the rest of nature	**43.8**	16.7	21.1	10.0	8.5		2.2	1.3	-0.012
	Plants and animals do not have equal rights as humans to exist	4.5	7.0	16.4	19.2	**53.0**		4.1	1.2	0.269
Fragility of nature's balance	When humans interfere with nature, it often produces disastrous consequences	5.0	10.0	15.4	23.6	**46.0**	10.18	3.9	1.2	0.357
	The balance of nature is strong enough to cope with the impacts of modern industrial development	26.4	**27.9**	25.1	12.4	8.2		2.5	1.2	0.049
	The balance of nature is very delicate and easily upset	6.2	9.7	21.4	29.1	**33.6**		3.7	1.2	0.321
Rejection of exceptiona-lism	Human intelligence will ensure that we don't make the earth unlivable	13.9	14.4	**38.1**	20.1	13.4	9.72	3.1	1.2	0.064
	Despite our special abilities, humans are still subject to the laws of nature	5.0	9.0	22.9	23.6	**39.6**		3.9	1.2	0.261
	Humans will eventually learn enough about how nature works to be able to control it	17.4	19.9	**36.3**	14.4	11.9		2.8	1.2	0.201
Possibility of an ecocrisis	Humans are severely abusing the environment	4.7	6.5	15.2	27.9	**45.8**	11.64	4.0	1.1	0.331
	Human destruction of the environment has been greatly exaggerated	**30.6**	21.6	23.9	14.9	9.0		2.5	1.3	-0.031
	If things continue going as they presently are, we will soon experience a major ecological disaster	5.0	10.7	22.4	26.9	**35.1**		3.8	1.2	0.313

*STA, strongly agree; SWA, somewhat agree; U, unsure; SWD, somewhat disagree; STD, strongly disagree; r_{i-t}, item–total correlation. Percentages may not sum to 100 due to rounding.

4.2 Economic value of Pagasitikos gulf coastal zone

As the existing literature suggests that people perception and preferences influence their decision to pay for natural environment, in our research, we study people's perceptions of quality and of the importance of different coastal zone aspects. Respondents have to specify the importance of seven attributes (Cronbach's Alpha = 0.760) of the coastal zone (as recreation destination). Results are given in Table 3 with just 56% being interested in recreation facilities.

Table 3: Most important beach and management issues for Coastal zone

	YES (%)	NO (%)
Seawater quality	95	5
Beaches' cleanliness	95	5
Information substructure	81.8	18.2
Security substructure	79.6	20.4
Seawater activities	76.6	23.4
Coexistence with fishers	78.6	21.4
Recreation facilities	56.2	43.8

Also trying to verify the utility that respondents assign to Pagasitikos gulf coastal zone, all participants were presented with seven statements (Cronbach's Alpha = 0.909) reflecting the main dimensions of coastal zone utility (identified through previous research of the authors in the area; Halkos and Matsiori 2012). The question was used to explore the motives behind the response to CVM scenario. The results distribution in Table 4 are not clear with the bequest motive closely equal to existence motives and with direct use motives also very close.

As mentioned a CVM was applied to explore people's motives for the economic value of coastal zone with a dichotomous choice asking people for their WTP for a change in coastal zone quality. With a dichotomous WTP dependent variable (Yes/No), binary logistic regression models were used (Halkos 2006).

Table 4: Importance of Pagasitikos gulf coastal zone

	TYPE OF VALUE	YES (%)	NO (%)
Because it provides recreational services	Direct use value	68.4	31.6
Because I may wish to visit it in the future	Option value	69.9	30.1
Because recreational services to our children will be provided	Bequest value	71.9	28.1
Because other people can visit the area	Direct use value	69.4	30.6
Because the area has economic values even if it is not visited by anyone	Existence value	72.6	27.4
Because the site provides a range of products besides leisure services	Direct use value	73.9	26.1
Because the area offers habitat to flora and fauna	Indirect use value	71.4	28.6

The results of the fitted model are presented in Table 5. According to the obtained empirical results, the bid amount (BID) was negative and significant to people's intention to pay. On the contrary, income, education and perception of people for coastal zone were all significant with positive relation to people's response to CVM scenario.

Table 5: Econometric results of the proposed logit model formulations

Variables	**Estimates**	**Odds Ratios**
Constant term	-3.567 [0.000]	0.028
BID	-0.041 [0.000]	0.960
Education (in years)	0.148 [0.003]	1.159
Income	0.001 [0.003]	1.001
Reason to pay (Future recreational use)	1.124 [0.000]	3.078
Importance (Coastal cleanliness)	0.896 [0.006]	2.449
Nagelkerke R^2	0.243	
LR χ^2_8	71.867 [0.000]	
Hosmer-Lemeshow	9,044 [0. 339]	
Cox & Snell R Square	0.180	
Log– Likelihood	416.576	

The mean WTP was calculated approximately equal to €23.06 per person by assuming no negative values for environmental protection using the formula suggested by Hanemann (1989):

$$E(WTP) = \left(\frac{1}{\beta_1}\right) * \ln\left(1 + \exp^{\beta_o}\right)$$

4.3 Exploring motives behind respondent's intention to pay

For having more information about the profile of people willing to pay for coastal zone protection a combination of applied methodological research techniques like Principal Components and Cluster Analyses was used. Respondents with a positive WTP were asked to allocate their WTP (expressed to 100%) among five different motives or reasons for their choice. The five reasons were associated with the criteria of Blue Flag prize (Table 6).

Next respondents were asked to specify the motives behind their WTP with the help of a modified version of a question used in Halkos and Matsiori (2012). This question tries to better understand the importance of coastal zone to people well-being and rely on: i) four criteria for awarding a beach with a blue flag award (Halkos and Matsiori 2012), and ii) the classification of Coastal and Marine Ecosystem Services from Potts et al. (2014). Only respondents who answered *yes* to CVM scenario were asked to indicate on a five-point Likert scale for each topic (Babbie 1989) their opinion for the importance of 27 reasons for saying yes to the CVM scenario and put an economic value on the coastal zone.

Reliability analysis of the question revealed that Cronbach-a was 0.895 (Table 6). The PCA has extracted three factors explaining 52.22% of the fluctuation of the total variance and Cronbach-a of each factor was 0.912, 0.796 and 0.725 respectively (Table 6). Kaiser–Meyer–Olkin (KMO) criterion for sampling adequacy was equal to

0.835 and Bartlett's test of sphericity was equal to 2057.191 (with a P-value of 0.000 and 325 degrees of freedom).

Table 6: Results of PCA about importance of aquatic resources

Factors Identification	**Variance Explained (%)**	**Cronbach's a**	**Total Cronbah's a**
Beach and environment protection (F_1)	30.15	0.912	0.895
Economic development of coastal zone (F_2)	14.88	0.796	
Tourism development (F_3)	7.19	0.725	
K.M.O.	0.835		
Bartlett's Test of Sphericity	Approx. χ^2 =2057.19 df = 352 Sig. = .000		

The correlations among the factors are significant with the high correlations between the extracted factors and the total factor (FTOT) showing that there are no grounds for future separation of some items from the factors that interpret the reasons for the economic value of coastal zones. Moreover, the high correlation between the first and third factors shows that people are interested in both recreation developments of the area and also for future management of coastal zone (Table 7).[4]

Next a cluster analysis was applied using the results of PCA for the sample segmentation according to their perceptions for managing coastal zones. K-Means and Hierarchical cluster analyses were used to having a better solution for the research data. The hierarchical cluster was first used to identify the number of the cluster to sample, with Ward's method showing the sample could be grouped into two clusters.

[4] For details on determinants of the environment and economic development see Halkos (1992, 2011) and for transparency, for public sector transparency and countries' environmental performance see Halkos and Tzeremes ((2011) and for cultural dimensions and corporate social responsibility see Halkos and Skouloudis (2016).

K-means Cluster Analysis for PCA results revealed two clusters that provide an acceptable distribution of cases across the clusters and the most interpretable solution.

Table 7: Correlations between PCA factors

	Beach and environment protection (F_1)	**Economic development of coastal zone (F_2)**	**Tourism Development (F_3)**	Ftot
Beach and environment protection (F_1)	1.000	.428**	.121	.883**
Economic development of coastal zone (F_2)	.428**	1.000	.441**	.717**
Tourism development (F_3)	.121	.441**	1.000	.442**
Ftot	.883**	.717**	.442**	1.000
** Correlation significant at the 0.01 level (2-tailed)				

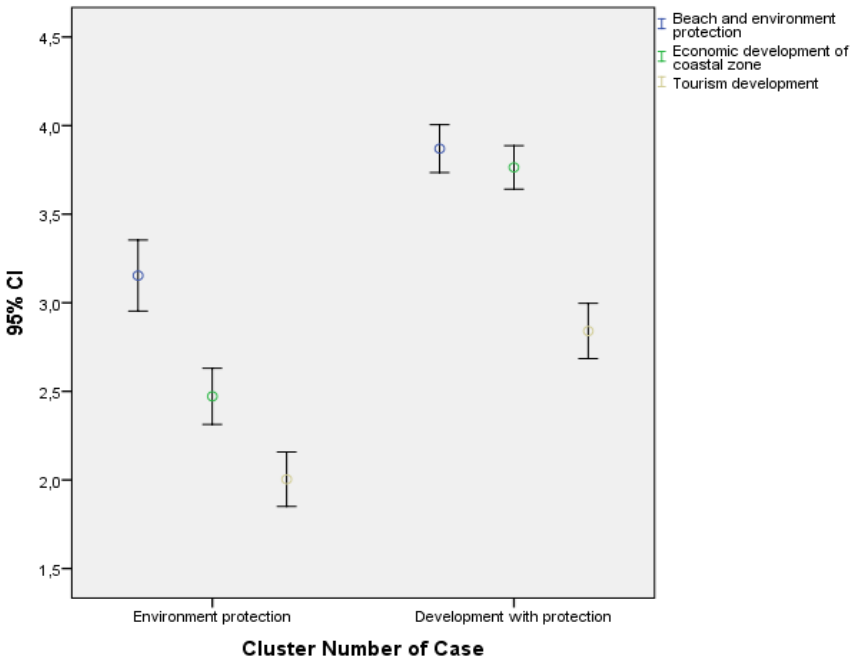

Figure 1: Mean scores for the three principal components and 95% confidence intervals for the resulted clusters.

In the final solution, we used only variables that were significant and had the ability to distinguish participants to different categories. The differences between the two clusters were found with respect to *beach and environment protection* (U=1027.5, z=-5.909, P=0.00], *economic development of coastal zone* [U=250.5, z=-9.24, P=0.00] and *tourism development* mean scores [U=942.5, z=-6.270, P=0.00]. A 95% confidence interval error bar verified the results of the Man Whitney U test that there is a significant difference between the means for each group (Figure 1).

Mann-Whitney U statistics show differences among clusters (Table 8). All motives means were significantly different between clusters (Table 9).

Table 8: Motives Means for Clusters.

	Cluster	
	Environment protection	**Development with protection**
N	**53**	**94**
Beach and environment protection (F_1)	3.15	3.87
Economic development of coastal zone (F_2)	2.47	3.76
Tourism development (F_3)	2.00	2.84

Significant differences between cluster for pairs of motives means shown (P=0.00). No significant differences between means of F_1 and F_3 for 1st cluster (P=0.828) and significance for 0,1 level for F_1 and F_2 for 2nd cluster (P=0.058)

Table 9: Comparison of factor scores for motives between clusters

	N	Cluster		
		Beach and environment protection	**Economic development of coastal zone**	**Tourism development**
Mean rank cluster 1: Environment protection	**53**	46.39	30.88	44.78
Mean rank cluster 2: Development with protection	**94**	89.57	98.31	90.47
Significance (P)		0.00	0.00	0.00

A series of tests did not detect any significant differences comparing the two clusters with the sample year (χ^2=0.741, df =1, P=0.389), gender (χ^2=1.034, df=1, P=0.309), age (Mann-Whitney U=2096.0, P=0.111) and education measured in years (Mann-Whitney U=2478.0 P=0.957), while income (Mann-Whitney U=2987.5, P=0.00) and NEP SUM (Mann-Whitney U=2042.0, P=0.070) identified significant differences. Mann-Whitney test was also used to explore the relationship between clusters and people's WTP without detecting significant differences (Mann-Whitney U=2096.5, P=0.109).

Figure 2 also shows that the two clusters have the same WTP (Mann-Whitney Test=2096.5, P>0.05). Figure 2 shows that the two cluster have approximately the same mean WTP (Mann-Whitney U=2096.5, P=0.109). Table 10 presents the results of non-parametric tests between the mean WTP of the two clusters and respondents' answers about how they allocate their WTP in some coastal zone issues representing the total economic value. Figure 3 compares percentage WTP between clusters.

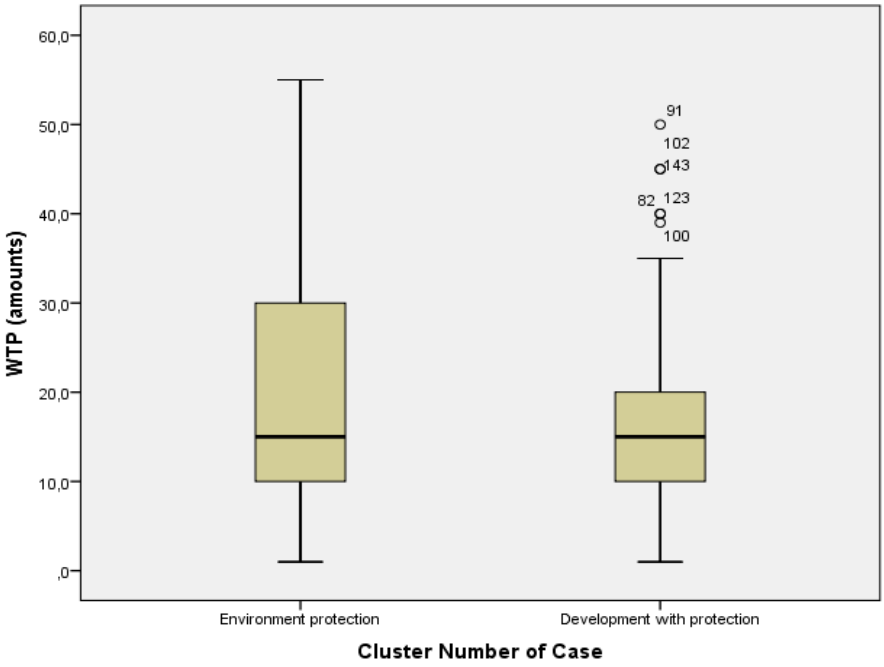

Figure 2: Mean WTP for the two clusters

5. Discussion

5.1. Ecological profile

According to the results the NEP scale possible minimum score was 23 and maximum of 74, mean scores are 49.29 (+ 6.54) closer to earlier studies (McFarlane *et al.* 2006, Halkos and Matsiori 2017). For Rideout *et al*. (2005), a NEP score above 45 shows a pre-ecological attitude. The mean score of the NEP scale was equal to 3.29, with a mean score equal to 3 representing people's attitudes between anthropocentric and eco-centric worldview (Rideout *et al.* 2005; Van Petegam and Blieck 2006).

Table 10: Percentage allocation of WTP

Null Hypothesis	Mean (% of WTP)	WTP (€)	Sig.	Decision
The distribution of "**Quality of bathing water – WTP1**" is the same across categories of cluster Number of Case	33.5	7.91	.373	Retain the null hypothesis
The distribution of "**Environmental education and information – WTP2**" is the same across categories of cluster Number of Case	16.8	3.96	.690	Retain the null hypothesis
The distribution of "**Safety, Lifeguarding first aid and services facilities – WTP3**" is the same across categories of cluster Number of Case	17.7	4.18	.000	Reject the null hypothesis
The distribution of "**Environmental Management – WTP4**" is the same across categories of cluster Number of Case	2.6	5.10	.180	Retain the null hypothesis
The distribution of "**Recreation facilities – WTP5**" is the same across categories of cluster Number of Case	10.4	2.45	.047	Reject the null hypothesis

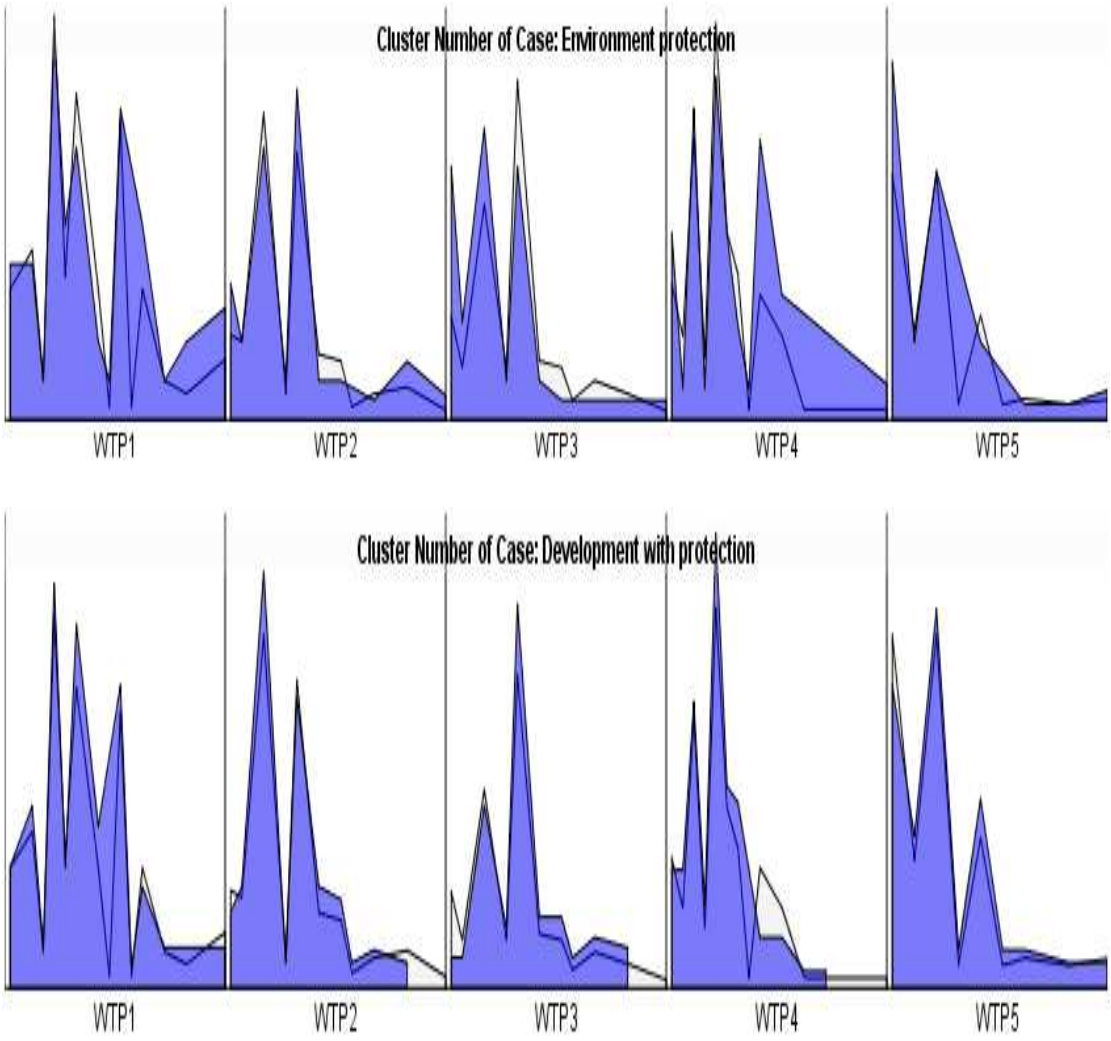

Figure 3: Percentage comparison of WTP between clusters

The mean sum of NEP scale of responses demonstrates a range of environmental attitudes. While most respondents agree to the statement that plants and animals have equal rights as humans to exist they insist that the earth has plenty of natural resources if people learn how to develop them. The last column of Table 2 shows item–total correlations for each item and according to the results there are correlations no reasonably strong. Cronbach's a coefficient is equal to 0.508. A low value of Cronbach's a (lower than 0.7) indicates problems with inner consistency of the questions in the scale (Peterson *et al.* 2008). For others researches a Cronbach-a

coefficient values closed to 0.6 can be accepted (Sekaran 2005; Hair *et al*. 2006; Kaiser 1974). Even so, the low Cronbach's a, as in previous studies in Greece, prove the need to change the scale because it is probably not understood by people in our country (Halkos and Matsiori 2017). In previous researches, the problem of the low value of Cronbach's a, has been attributed to the fact that concepts in the NEP statements were new to respondents (Abdullah et al. 2014; Costello and Osborne 2005; Wu 2012).

Moreover, the prior conclusion is reinforced when looking at the last column of Table 2. The negative values of item-total correlations mean that questions are both unclear and may confuse respondents or even being mistaken questions. Very low values of item-total correlation (between 0 and 0.19) may point out that the question is not discriminated well. In the literature there is not an acceptable level for item–total correlations with a value of 0.3 being acceptable (Aldrich *et al.* 2007; Clark *et al.* 2003; Dunlap *et al.* 2000).

Mann – Whitney test shows no significant relationship among mean NEP scale score and gender (U=21216.5 P=0.367), age (Spearman's ρ: -0.690, P=0.166), education (Spearman's ρ: 0.082, P=0.101), income (Spearman's ρ: 0.590, P =0.263) people's past pay for natural environment protection (U=2941.05, P=0.619).

Then according to Kotchen and Reiling (2000) the sample was categorized as having weaker, moderate (NEP score between 46 and 59), or stronger (NEP scores ≥59) pre-environmental attitudes according to NEP results. The chi-square test shows significant differences among NEP score groups (χ^2= 5.15, P<0.05), showing that environmental attitudes are related to people's responses to CVM scenario. The proposed causal relationship between NEP scale and conservation-related WTP estimates has been proved in many studies (Aldrich *et al.* 2007; Kotchen and Reiling,

2000; Halkos and Matsiori 2017). In contrast, Cooper et al. (2004) using an open-ended contingent valuation question ended that there is no significant relationship between NEP scores and contingent values of water quality improvements supporting that the water quality improvement for water resources (like a lake) is associated with potential use values which conflict the existence-value orientation of scale and here might lose its association with contingent values.

Finally, a series of tests to compare the NEP score groups with age (Kruskal-Wallis W=1.905, P=0.386), gender (χ^2=0.856, P=0.652), education measured in years (Kruskal-Wallis W=4.659, P=0.097) and income (Kruskal-Wallis W=7.642, P=0.022) detect significant differences only with income and (marginally) with education. According to other studies socio-demographic indicators have no (or limited) relation with people's environmental concern (Gooch 1995; Van Liere and Dunlap 1980). However, there are other studies that suggest that demographic characteristics (as gender or area of living) can used to explain people'σ environmental concern (Casey and Scott 2006; Rauwald and Moore 2002).

5.2. Economic value of Pagasitikos gulf coastal zone

Perceptions of stakeholders about recreational use of the coastal zone were considered as essential because many times local people suffer from governmental decisions and their observations and experiences of coastal management are important for evaluation and improvement of environmental management programs. The construction of the perception questions was based on specific issues affecting coastal zone management. Respondents' answers reflect their awareness about coastal attributes. These attributes included the cleanliness of beaches, the quality of seawater, recreation and sea water activities etc. Seawater quality and the beaches

cleanliness were classified (Table 3) as important at previous researchers (Schuhmann 2010). Close related is the need for information substructure while on the contrary recreational facilities seem not so important to respondents.

A question was used to explore the motives behind the response to CVM scenario. Table 4 shows that current and future use of coastal zone and both with non-use values estimated in our study are is line with other studies (Gunawardena and Rowan 2005; Yang et al. 2008; Becker et al. 2012; O'Garra 2012; Subade and Francisco 2014). Local communities are willing to pay more to ensure resources will be available to future generations (bequest values) despite their poverty conditions (Oleson et al. 2015). In a valuation study among residents of Quezon City for conservation of reefs bequest concerns for future generations was the main reason for people's WTP (Subade and Francisco 2014). The non-use values influence more than the use values people's decision in valuation studies of endangered species (Tisdell and Wilson 2004).

The results of our CVM analysis are expected. Bid amount (BID) was negative and significant, thus higher BID values, resulted in lowering probabilities of responding 'yes'. As it can be seen only education and income from the demographic variables have statistically significant effect on the respondent's probability in answering 'yes' or 'no' to the valuation question.

People with a higher education level have a higher tendency to prefer the coastal zone improvement project (Dorsch 2014, Camacho-Valdez *et al.* 2013, O'Garra 2012, Bell et al. 2003; Kriesel et al. 2004; Veisten et al. 2004; Ojeda *et al.* 2008; Eggert and Olsson 2009; Rolfe and Windle 2012, Halkos and Matsiori 2012). Beharry and Scarpa 2010 (among others) claim that educational programs help with the effective application of any management program. Higher educated people

comprehend the need for managing environmental resources better than others who are not well-educated (Langford *et al.* 1998). On the other hand, Van Lier and Dunlap (1980) point out that people's education level is a predictor of environmental concern. The strong positive connection between education and environmentalism is a finding of other studies (Mohai and Twight, 1987).

Our empirical analysis proved the positive effect of income on respondents' response to CVM scenario (Morrison and Bennett; 2000; Brander *et al.* 2006; Ojeda *et al.* 2008; Peters and Hawkins 2009; Zander et al. 2010; Petrolia and Kim 2011; Rolfe and Windle 2012; Camacho-Valdez *et al.* 2013). This positive influence of income on people's responses on CVM scenario is a proof that they take into consideration their budget constraint (Mitchell and Carson 1989). According to Schläpfer (2006) the measurement of income effects in a CVM research counts the change in stated WTP due to a change in income although there is less proof that income is a determinate factor of people WTP.

On the other hand, "coastal cleanliness" is one of the most significant determinants of yes/no responses with "Future recreational use". This coastal cleanliness was a predictor variable of people responding to CVM scenario in various studies (Sarraf *et al.* 2004; Schuhmann 2012). Shivlani *et al.* (2003) argue that the beach quality (available space, cleanliness of beach and coastal water, and amenities offered) is an influencing factor of individuals' demand with cleanliness being again a satisfactory reason for beach users (Mouat et al. 2010).

Finally, respondents are paying more when areas provide creative activities to the future (Bockstael *et al.* 1987; Sarraf *et al.* 2004; Schuhmann 2012; Halkos and Matsiori 2012; Hynes *et al.* 2014). It is important to mention that respondents do not

pay for present recreational opportunities but are more interested for a future recreational use of coastal zone.

The NEP scale of environmental attitudes (NEP) has not a significant influence on peoples' response to CVM scenario. Then trying to explore the relationship between people's NEP scale scores and their responses to CVM scenario, peoples' score of NEP scale was insignificantly related to their correspondence to CVM scenarios (χ^2=5.515 df=2, P=0.063) with a mean WTP approximately equal to €23.06 per person.

5.3 Exploring motives behind respondent's intention to pay

First, respondents were asked what precedence of their WTP would like to go to specific reasons. According to the results the main reason (33.5%) of total WTP is given for improving the quality of bathing water and equals to 7.906 €.

Consistent with the results, people's WTP was positively correlated with the reason "environmental management" (Spearman's ρ: 0.210, $P < 0.05$). On the contrary "support of recreational activities" was negatively related with respondent' WTP (Spearman's ρ: -0.1345, $P < 0.05$). No significant relation was revealed among other reasons and people's WTP, like environmental education, water quality for recreational activities, and "safety facilities". Individual choices of the reason for which respondents selected to invest their WTP were used to identify the underlying factors influencing WTP for coastal zone conservation.

A PCA analysis was used to identify the motives behind the economic values of the area. The result of PCA was similar to the results of a previous application of the question at Halkos and Matsiori (2012). The first factor was the most important, explaining 30.147% of the total variation in the data and can be also called "beach and environment protection". Protection of the natural environment and the entire

ecosystem was the first prepossession of people who say yes to CVM. The item of the greatest response from individuals was "conservation of marine ecosystem and fish stocks", while the "protection of coastal beaches" was the 3rd item loaded to the factor. This item was 1st loaded to previous application of the question and this differential may be due to the sample consistency. At Halkos and Matsiori (2012) the sample was consisted only of recreational users of the area.

The factors partially representεδ the structure of values, related to ecosystem services are in line with dimensions of sustainability: environmental (ecological), economic and social (Cole *et al* 2015). Moreover they are in line with Cummings and Harrison (1995) who claim that total value has two components: those of separable motive-related values and use-related values.

The items of the first factor are non-economic motives related with existence and direct uses values. The existence value originates from the value people assign simply to existence of coastal zone ecosystems and usually is related to altruistic motives (Hanley and Barbier 2009). We note that coastal zone should be protected not only because it provides many goods and services but as it is also an important ecosystem contributing to people's well-being. Previous studies prove that people (residents and visitors) value highly the ecological features of coastal areas, as well as their biodiversity (Torres and Hanley 2016).

Participants' WTP was positively correlated with the first factor (Spearman's test: 0.184, $P < 0.05$) and there was a significant relation between NEP scale score and the first factor (Kruskal–Wallis: 13.524, $P < 0.05$). According to Turpie *et al.* (2003) while existence values of coastal resources are relative to terrestrial resources, people value these mainly for ensuring local incomes related to tourism.

The second factor which was identified by the participants in the research was named "economic development of coastal zone" and was not related to a specific category of natural environment total economic values. For people who said yes to CVM scenario some dimensions of direct use values emerge. The third factor was also related with direct use values of the coastal zone. Oh *et al*. (2008) state that residents are interested in taking measures for developing coastal zones. The third factor was called "tourism development" and was related to recreational services and information facilities. According to Budowski (1976) trying to explore the relationship among environmental impacts and tourism development point out that they can conform together. The important economic benefits of tourism make society to want further boosting the development of this sector (De Gobbi 2013).

Then we applied clustering analysis techniques to identify individuals' groups with respect to their motives for paying. Cluster Analysis allows researchers to group together variables according to similarities in the profiles. The results of cluster analysis do not revealed significant differences between mean WTP and clusters. On the contrary, the different population segments may have been used to explain the way people allocate their total WTP. While respondents give 33.5% of their WTP to ensure quality of bathing water, significant difference was detected between clusters and "Safety, Lifeguarding first aid and services facilities" and Recreation facilities. So WTP of the second cluster (Development with protection) is higher for "Safety, Lifeguarding first aid and services facilities" and "Recreation Facilities".

6. Conclusions and policy implications

Literature findings are mixed for the relationship between environmental attitudes and environmental WTP. Cooper et al. (2004) suggest that nature of the goods is the determinant factor for the relation, and when we refer to public goods (with existence or intrinsic values) the attitude-WTP association is expected than in the case of other goods with potential use values. In our study this relation is investigated using attitudinal questions (including NEP scale) and socio-demographic characteristics. Then we capture the motivations behind WTP for coastal water quality, including individual's perceived importance of environmental protection.

The findings reveal the psychological, personal and demographic factors affecting people's intention to pay for coastal zone improvement. For this reason we try to determine the factors influencing people's response to a CVM scenario for coastal zone improvement quantity. The results do not confirm the determinant role of NEP scale to people's probability to pay for the coastal zone. Moreover the low value of reliability test is in line with previous applications of NEP scale to our country and leads to the conclusion that NEP scale items are not understood. On the other hand attitudes and motives towards the environment are important for understanding public values for environmental goods such as coastal zone. More specifically demographic information helps understanding people's intention to pay. Finally, others attitudinal data (about the future use of area) are important in people's decision for paying.

Summarizing our findings, a great number of people were willing to pay for improving quality of coastal zones. This is important and may help design of effective environmental policies taking into account benefits and costs of proposed actions and their alternatives. In addition the results confirm the suggestion for using attitudinal questions in CVM studies. Our study provides useful information about how people

understand coastal zone attributes and their uses. This information could contribute on the success of environmental protection programs and public environmental education policies. The incorporation of people preferences and needs to management plans leads to more effective policies and allocation of budget process.

On the other hand, our study explores the links between general attitudes and specific payment intentions. NEP scale has no influence to people decision for the specific amount. People pay more when they want to improve water quality.

Our results segment population with intention to pay for the coastal zone protection. According to the results, none of attitudinal data used had significant relation to people's intention to pay. On the contrary these variables had an influence to general people behavior against coastal zone management. The results explain why people place values on coastal zone and can help the decision makers to formulate effective management programs according to people's orientations.

Our experimental modification, which allows us to understand people's preferences expressed by the supporters of a water quality program, has greater research implications for illustrating how attributes and coastal area uses affect people's intention to pay and allocate this amount in practice. Finally, our results underline the need of various factors (anthropomorphic and anthropocentric) in conjunction with WTP data for understanding how people take their decisions for biodiversity conservation.

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