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CERCIS Working Paper
December, 2022
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Abstract

In the main framework of environmental protection and climate change issue, part of the interest is focused on beach and littoral protection. The aim of this research is to understand people's willingness to pay for environmental protection and management of Italian beaches and littorals. Italian beaches and littorals are constantly under pressure because of the combination of annual mass tourism, especially during summer season, and climate effects. The analysis is conducted using contingent valuation method (CVM) to investigate how much tourists and residents in the Italian Regions of Marche – Adriatic coastline - and Campania – Tyrrhenian coastline. Four main coastlines are under analysis, San Benedetto del Tronto in Marche and Agropoli, Battipaglia, Capaccio and Eboli in Campania. Generally speaking, the results show that the tourists are more willing to pay for environmental protection and specific management programmes. Moreover, the results report that short-term effects on the environment and beauty of the littoral are more valued than long-term effects. We observe that WTP is lower when including resource depletion as a control variable concerning the same value for, say, cigarettes.

Keywords: contingent valuation, willingness to pay, beach management, pro-environmental behavior

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1. Introduction

Coastal areas are characterised by complex connections among environmental, social, and economic factors; seashores are at the same time crucial for environmental balance and biodiversity and a resource for the local economy through environmental services and tourism. In this view, coastal areas must be considered as socio-ecological systems (SES; Anderies et al., 2004 and McLachlan et al., 2013), in which the physical beach, its resources, users, managers, services and infrastructures are interrelated elements (Peña-Alonso et al., 2018; Rodella et al., 2019). Coastal areas are increasingly under pressure because of the combination of annual mass tourism that induces environmental impacts and pressure on coastal and marine environments, and climate change effects. In this context, beach management programs could represent a win-win solution by offering beach users adequate services and recreational activities during the summer season and preventing environmental degradation due to climate change and tourism itself.

The contingent valuation method (CVM) is a tool that highlights beach users' preferences in terms of money allocation to improve beach management. CVM asks directly if individuals are interested in paying a pre-fixed amount of money and which scenario they want to support. In this sense, CVM and Willingness to Pay (WTP) are used as indicators of beach user engagement in beach management and have been the most applied approaches to assess the economic value of a beach as

a non-market good (Logar and van den Bergh, 2012; Pearce et al., 2006; Peng and Oleson, 2017; Rodella et al., 2020).

The state of the art in tourism and climate change mitigation shows a connection between the economic and environmental protection side that can be exploited as a channel of resources toward environmental policies. Tourists have shown to be more sensitive to the state of the environment and beauty of the place they visit, and different studies focused on finding the levers that could increase the likelihood of a higher WTP. This literature highlighted that besides socioeconomic characteristics such as income and age, also climate-related risk perception, interest in natural areas, environmental and beach quality, local amenities, aversion to beach litter, and the purpose of the trip, are all factors that can influence the WTP (McCreary et al., 2018; Enriquez-Acevedo et al., 2018; Halkos and Matsiori, 2012).

Also, user provenience can affect the WTP estimation, especially the preferences of residents: our idea is that their WTP could be leveraged through different channels than those of tourists. The literature supports this, indeed a few contributions highlighted that while on the one side tourism is perceived as "good" because of the improvement in the local economy and increasing awareness of environmental problems, on the other it is also often perceived as a threat because of the increase in pollution, noise and resource deployment it accompanies (Martin et al., 2018). Therefore, residents could show different preferences and perceive different (environmental) problems than tourists, also depending on the years of residence in a certain beach locality (Almeida-García, et al. 2016), and possession of second homes (Krelling, Williams, Turra, 2017). Therefore, monitoring residents' and tourists' opinions is necessary to assess foreign and local feelings, and such monitoring can be useful into tourism projects. In particular, knowing residents' attitudes may result in policies that minimize the negative impact on tourism development and maximize the benefits (Dyeret al., 2007).

This study contributes to the literature that seeks to understand whether and how tourism can be a channel for raising resources to support policies for climate change adaptation and environmental protection. We aim to investigate the existence of differences in WTP between tourists and residents in coastal areas affected by mass tourism pressure in Italy. Moreover, we proposed a survey to elicit beach users' WTP for beach cleanliness, safety, and environmental protection in Marche and Campania Italian littorals, which are annually affected by mass tourism during the summer season. Our main result supports our view that tourists and residents do have different WTP. Specifically, while tourists seem to be more interested in environmental protection, residents are willing to pay more for beach cleanliness and the safety of the littoral. This result backs the message that different individual preferences open multiple channels that can be leveraged to attain climate change mitigation and environmental protection goals. The paper is divided as follows: Section 2 presents the literature review, while the study area is described in Section 3. Section 4 is dedicated to material and methods; Section 5 presents results and Section 6 concludes.

2. Literature review

The European Union Environmental Commission calculated that one-third of the European population lives within 50 km of the coast, and their GDP generated an amount of over 30% of the total EU GDP Data from The EU Blue Economy Report (2021) shows that the EU Coastal tourism in 2018 has generated a GVA slightly more than 80 billion of euro, a 21% rise compared to 2009. And a Gross operating surplus valued at 27.8 billion euros (+44% compared to 2009). The sector has

obviously suffered from a contraction during the pandemic period. The Mediterranean is considered one of the main 'climate change hotspots in Europe' (EEA, 2017). Projections suggest substantial warming and increase in heat waves, dry spells and droughts in the region (EEA, 2017), therefore the CC effects will dramatically affect coastal activities.

As shown in the literature, awareness of climate change can affect an individual's WTP. A seminal paper by Berk and Fovell (1999), assesses how different climate change scenarios influence WTP in the Los Angeles area, finding that most of the individual's preoccupation with climate change relates to increasing temperatures and lowering precipitation. While the phenomenon was not on average perceived as irrelevant to the lives of the interviewees, only 40% of them were prepared to pay for its prevention.

Moreover, coastal areas are also affected by several other pressures such as habitat loss and degradation, pollution, and overexploitation of resources. The Mediterranean basin, as well as other touristic destinations, is likely to be extremely affected (Torres-Bagur, *et al.* 2018).

In this framework, a large part of the literature on tourism and climate change adaptation focuses on understanding which is the most effective strategies, showing that there is a correlation between the economic side – tourism – and the environmental protection side, that can be exploited.

McCreary et al., (2018) explores factors that may influence tourists' WTP for climate change adaptation in nature-based destinations, including income, age, and climate-related risk perceptions. Results show that tourists' interest in natural areas can be leveraged by local governments in their climate change mitigation strategies, generating a win-win situation that benefits both the local ecosystem and the local economy. Similarly, Cetin et al., (2017), which evaluate the effect on tourists' WTP of tourism taxes in the Istanbul area, reports that visitors are willing to pay an additional amount of tax if this is related to improvements in their touristic experience, even though it seemed that the overall sustainability of the destination was less relevant.

Researchers present similar results also about coastal areas. A paper by Enriquez-Acevedo et al., (2018), which investigates WTP for beach ecosystem services in Colombia, points out that beach quality is crucial for the payment amount: while WTP seemed to depend less on economic variables, it was more defined by concerns regarding ecosystem services loss. Schumann and colleagues (2016), investigated visitors' perceptions of environmental quality, preferences for coastal amenities, and willingness to pay for changes in coastal lodging attributes in Barbados, finding that preferences for beach-front lodging and the aversion to beach litter can increase visitor's WTP for beach clean-up services. Halkos and Matsiori (2012) investigate the motivations behind people's WTP for coastal zones' water quality improvements, finding that the drivers of WTP are mainly related to individuals' expectations for future tourism development, followed by the preoccupation with coastal environment management and coastal zone protection. Both López-Sánchez and Pulido-Fernández (2017) and Duran-Roman et al. (2021), investigates tourists' WTP for taxes and fees aimed to improve the sustainability of their destination in Andalusia region, Spain. Besides the relevance of sociodemographic characteristics and budget constraints on the vacation, they find that tourist behaviours such as place of origin, fellow travellers, accommodation, and purpose of the trip are relevant factors related to an increased willingness to pay.

Increasing tourism activities has created many positive effects such as developing new jobs opportunity for local people, new touristic sites, and improving the image of the countries in the eye of tourists. Nevertheless, if not organised properly, it may have major detrimental effects on the physical environment as well as on cultural monuments and values (Kocasoy, 1995). Referring to

coastal areas, for example, increasing the number of visitors beyond the sensitive limit of the environment, trigger undesirable variations in the ecosystem – "bearing capacity" effects – and even though these effects differ depending on the environment considered and its environmental condition and pollution, they always create unbalance in the ecosystems with negative effects on flora and fauna (Kacasoy, 1995). Tourism has an undeniable impact on coastal areas: the first is the water – water pollution and water supply scarcity – manifested not only in regions with water-scarcity problems but also where water is abundant (Baoying, Yuanqing, 2007). Other studies conducted on the Mediterranean coasts have demonstrated that the littorals are responding differently to the combined action of climate change and human activities: erosions and flooding are the major threats to the preservation of the coasts and these phenomena are intensified by the presence of mass tourism and human activities and settlements (Rizzetto, 2020; Burak, Dog, Gaziog, 2004; Roca, Gamboa, Tabara, 2008).

Could tourism negatively affect the WTP of residents in a specific area? Thanks to our survey, we can also investigate if WTP for beach services changes for residents when accounting for the perceived damage that is caused by tourism. Following Garcia et. al (2015), even though tourism can contribute to raising awareness of protecting and preserving the environment, it can also be a cause of its deployment and destruction, when it is developed in yet too fragile contexts. Indeed, on the one side, residents agree that tourism can help environmental preservation, while on the other they recognize that it also creates more pollution, waste generation, and resource use, together with congestion in public facilities and resources, due to overcrowding in certain times of the year. These are among the more negative impacts perceived along with price increment, closure of local economic activities in favour of more tourist-oriented ones, increased noise, and perceived insecurity (Martin et al. 2018), traffic congestion and parking problems (Lindberg&Johnson, 1997; Sheldon&Abenoja, 2001), serious environmental damage and significant increases in waste and pollution (Andereck et al., 2005; McGehee&Andereck, 2004). This tourism-related inconvenience and collateral damage could cause the local population to form and perpetuate negative attitudes toward tourism (Almeida-García, et al. 2016).

In conclusion, the literature agreed with the fact that the population is aware of the risks and challenges posed by climate change and that, albeit with varying degrees of intensity, they are willing to pay for adaptation strategies. With reference to the coastal environment, tourists seem to be the group most willing to pay for the protection of the places they visit; this would seem to depend not so much on the economic or social conditions of the tourists but on the desire to preserve the natural characteristics of the amenities. Thus, tourism can be leveraged as a further channel for resources aimed to support environmental protection policies, highlighting the many benefits of cultivating and improving tourism settings and places. At the same time, there are context-specific factors related to the attitudes of residents towards tourism that needs to be considered to ensure the success of environmental policies.
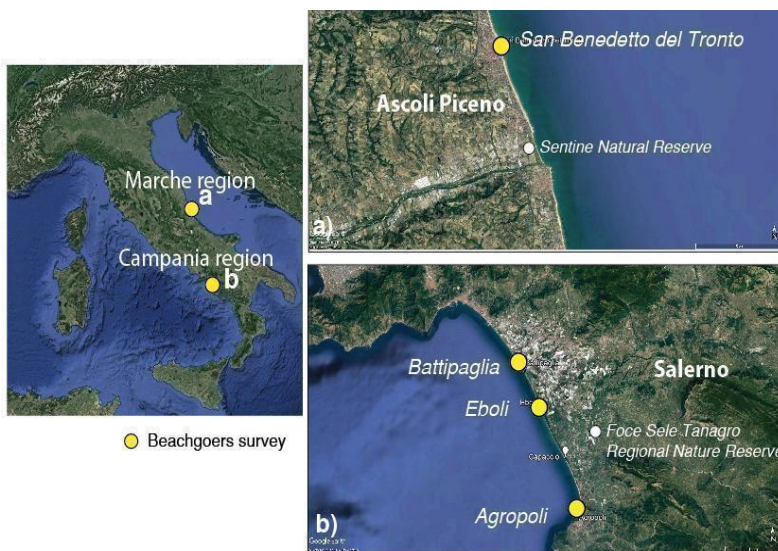
3. Study area

The study considers a total of 4 beaches distributed along two Italian regions (Figure 1): San Benedetto del Tronto (Ascoli Piceno Province, Marche Region) on the Adriatic coastline and Agropoli, Battipaglia, Capaccio and Eboli (Salerno Province, Campania Region) in the Terranean

coastline. These sites are generally characterised by linear low sandy beaches affected by many types of human and natural pressures and by mass tourism during the summer seasons.

Furthermore, some stretches of the coast present erosion issues due to the presence of upstream structures that retain sediments (e.g., the northern stretches of San Benedetto del Tronto), dune damages (e.g., Eboli littoral; Chiavazzo et al., 2017), storm surges, and tides.

Figure 1 - Location map of surveys: San Benedetto del Tronto (a) and the Salerno Gulf (b) in Italy

3.1. San Benedetto del Tronto (Ascoli Piceno)

From the 60s and 70s, Marche Region has seen the result of industrial development and beach tourism, reflected in a strong development of civil and maritime artificial structures. Its coastal zone is characterised by historical centres, residential, industrial, and port areas, besides accommodation facilities (hotels, beach establishments, camping sites, etc.). It should also be noted that about 62% of the Marche coast presents a significant level of urbanisation (Legambiente, 2011). The first bathing establishments were built in the main coastal cities in the mid-800 (1853 in Senigallia and 1865 in San Benedetto del Tronto), while in the early post-war period (around the 50s and 60s), were realised numerous beach resorts alternated with free beaches, generally without services.

Before the COVID-19 pandemic, Marche was ranked 12th among Italian regions by the size of hospitality – expressed number of beds (ISNART, 2014) – given that it guarantees several accommodation facilities (both hotel and complementary) equal to 5,654, of which 41.3% along the coast, and about 337,000 beds, of which over 74% in coastal municipalities (Acciarri et al., 2017).

San Benedetto del Tronto (AP) beach has a total extension of 7,970 m – of which about 3,290 m equipped and managed by 114 beach concessions – 1,700 m encompassed by free beaches, 1,340 m of the port area, and 1,630 m of Regional Nature Reserve. This is a linear urban beach (Rodella *et al.*, 2019), located in front of the San Benedetto del Tronto city, and it has many facilities and services that characterised its recreative status. The beach is composed of sand (fine sand, 0.125 - 0.25 mm), and it is protected for 4.7 km from detached breakwaters, while the only area of Sentina Nature Reserve to the south (about 1.8 km), is devoid of defence systems (Acciarri *et al.*, 2017).

According to Marche Region (2020), for the year 2020 (during the COVID-19 pandemic) San Benedetto del Tronto annually received an average of 119,000 arrivals and 532,790 presences (equal to 47.87% of arrivals and 48.11% of the attendance of the entire province of Ascoli Piceno, Marche Region, 2020); the 2020 numbers decreased from 178,387 arrivals and 790,326 presences in 2019 (Marche Region 2019).

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3.2. Salerno Province

The study is located in the Salerno Gulf (Campania Region) which encompasses the municipalities of Salerno, Pontecagnano Faiano, Battipaglia, Eboli, Capaccio, and Agropoli (Figure 1b). This stretch of coast is extremely rich in environmental, archaeological, and cultural features. Despite the presence of exceptional natural areas covered by dune fields, residual areas are occupied by pine trees implanted in the 50s to stabilise the inland from the sea (Chiavazzo *et al.,* 2017). The "Foce Sele Tanagro Regional Nature Reserve" guarantees the maintenance of the Sele river mouth and the adjacent coastal stretch (about 17 km in length and about 300 m in width). The same area is also included in the perimeter of the Natura 2000 area IT8050010 "Coastal stretch on the right and the left of the Sele river". The coastal area is also characterised by the dune system of the Oasis in Torre di Mare (Capaccio) and Campolongo (Eboli), and the presence of *Caretta* sea turtles (Legambiente, 2015).

Battipaglia coast, which measures about 4 km in length, has beaches with widths ranging from 30 to 70 m that included 19 bathing establishments and 10 free beaches. The beach, consisting of golden sand similar to Eboli and Capaccio beaches, has residual dunes alternated with anthropic structures.

Eboli beach measures about 8 km and consists of beaches with widths from 15 to 120 m, in which are located 11 beach establishments. Most of Eboli's beaches are free reaching by fire-resistant roads across the pinewood of the "Riserva della Foce del Sele".

Agropoli coastal zone measures about 2 km in length (from the Agropoli promontory to the North, to Lido Azzurro to the South), varying in size from 10 to 50 m, and it is characterized by 11 beach establishments and 6 free beaches. This coastal stretch is heavily anthropized and is confined inland from Agropoli urban centre and the railway line and to the sea by defence works emerged and submerged breakwaters, dams, and groins.

The tourist movements in the Salerno province registered 134,256 arrivals and 518,596 presences in 2017 (Istat, 2017).

4. Materials and Methods

4.1. Beach users' perception, questionnaire, and sampling

A questionnaire [1] was developed to elicit visitor preferences on the coastal environment, and safety in 2017, to capture beachgoers' interest in services, security, and environmental protection. The questionnaire was designed with the support of the National Lifeguard Society [2] and other

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[1] The full questionnaire is available in Appendix 1
[2] https://www.salvamento.it/

professional figures (beach operators and lifeguards) in the field of beach management. A focus group discussion was held with a total of 10 participants for a pretest conducted in May 2017 to detect sources of potential bias and identify misunderstandings and wording in the questionnaire (Arrow et al.,1993; Huhtala,2004; Nunes,2002). The survey was structured into three sections. The first one collected information on users' characteristics such as gender, age, and educational level, as well as information about beach frequentation and beach users' motivations for attending a specific beach. The second part was focused on eliciting WTP for beach cleanliness and safety, the presence of services and facilities, and environmental protection. The third section was related to perception, asking respondents to rate the presence of litter and waste, the effect of tourism – such as pollution and resource depletion – and the facilities and services present on the beach.

For most questions, we asked respondents to evaluate their answers on a 6-point Likert scale, with 0 referring to the lower valuation and 5 referring to the highest.

Data were collected from June to September 2017 both in Salerno Gulf and San Benedetto del Tronto. The time for data collection was between 9:30 am and 6:30 pm. In the case of a group visit, only one person was interviewed to avoid the risk of doubling a specific answer. The final sample includes 387 observations.

Summary statistics for respondent demographics and travel characteristics are presented in Table 1. Users were equally divided between males (47.3%) and females (about 49.2%) having an average age of about 36 years old. Specifically, the users' sample was prevalently composed of young (30.6% of users below 25 years) or mature people (almost 65% of users from 26 to 65 years), rather than elders (only 3.2% of users had more than 66 years). Respondents were predominantly not residents in the beach locality (52.7%) and about 40% of them were regular users of that beach. Overall, 13% of beachgoers evaluated as good the quality of the services offered. The main type of user was families with children (48.5%) spending more than 15 days (40.3%) in the locality. Non-resident beachgoers were 55% of the sample. Two-thirds of the surveyed population (66.36%) declared to be interested in environmental and beach protection, and 82% did prefer clean beaches, among the services offered by the littoral, most of the answers reported the highest rating in cleaning services. This was followed by security services. Overall, beach cleaning was not judged positively since more than 60% of the respondent declared to be annoyed with litter on the beaches. Specifically, respondents reported viewing a high presence of organic litter and cigarette buds, followed by plastics, papers, mixed litter, and other materials like metal and rubber.

Table 1 - Descriptive statistics of the variables used in the analysis

Variable	Description	N	Mean	Std. Dev.	Min	Max
Demographic variables						
Gender	1=male 2=female	376	1.489	0.501	1	2
Age	Age of respondent	382	34.581	15.265	0	75
Resident	0=resident 1=non-resident	387	0.499	0.501	0	1
First time	1=yes 2=usually 3=sometimes	377	2.164	0.772	1	3
Length of vacation	1= today 2= 2 to 7 days 3= 8 to 15 days 4= 15 days +	366	2.792	1.140	1	4

Perception of climate change (CC)						
CC caused by human activity	0= No 1= Yes	387	0.357	0.479	0	1
CC is a natural event	0= No 1= Yes	387	0.620	0.486	0	1
CC is a mix of both human activity and nature	0= No 1= Yes	387	0.447	0.498	0	1
Perceived effects of tourism on the environment						
Pollution	Perception of pollution as a main effect of tourism from 0 (low perception) to 5 (high perception)	373	3.579	1.329	0	5
Natural areas	Degradation of natural areas as a main effect of tourism from 0 (low perception) to 5 (high perception)	367	2.940	1.371	0	5
Resource depletion	Resource depletion as a main effect of tourism from 0 (low perception) to 5 (high perception)	364	3.118	1.447	0	5
Perceived Presence of waste on the littoral						
Cigarettes	Presence of cigarettes on the littoral – value from 0 to 5	293	3.239	1.6	0	5
Microplastics	Presence of microplastic– value from 0 to 5	366	0.913	0.283	0	1
Perception of beach services and facilities						
Parking	Value assigned to the presence of a parking area from 0 (low) to 5 (high)	379	2.641	1.623	0	5
Beach access	Value assigned to the presence of an access to the beach from 0 (low) to 5 (high)	377	3.39	1.356	0	5
Café/restaurant	Value assigned to the presence of a food court from 0 (low) to 5 (high)	375	3.205	1.591	0	5
Sports Area	Value assigned to the presence of a sport area from 0 (low) to 5 (high)	372	2.567	3	0	5

4.2. Contingent Valuation and the used model

This study uses a close-ended approach to elicit an individual value by asking if one would be willing to pay a given amount, included in a set of bids.

Based on the pilot groups and the literature (see for example Rodella et al., 2020), the sets of bids used in this study are as follows: 2 €, 5 €, 10 €, 20 €. Bid amounts are proposed to a respondent who either accepts or rejects the amount. The WTP question was stated in the following way: *"In case a financial fund is constituted in order to ensure the appropriate beach management, are you willing to pay X € (per person) each season in this territory?"*

The respondents were asked [3] whether they would be willing to pay an initial bid: if they said "yes" to the first amount (t_1, e.g., 10 €), they were then offered a second one, twice the amount of the first (t_2, in this case, 20 €). If the initial response was "no", they were proposed half of the first bid amount (t_2, i.e., 5 €). If they answered "no" to both bids, the WTP was 0 €. Concerning the list of bid amounts, the initial bid levels used were randomly chosen among the four bid amounts: 2 €, 5 €, 10 €, and 20 €.

As a result, we collected four sets of bids, (2 €, 1€, and 4 €), (5 €, 2.5 €, and 10 €), (10 €, 5 €, and 20 €), (20 €, 10 €, and 40 €)

Each participant that answered "yes" would also be asked to indicate one or more management areas they preferred to pay for: beach cleanliness, beach safety, and security, and environmental protection.

Our analysis uses the double-bounded (DB) model proposed in Lopez-Feldman, (2012), which demonstrates to have a higher statistical efficiency than a single-bounded dichotomous model when relatively large samples are not available (Hanemann et al., 1991). This approach allows using of both answers provided by the interviewee, whereas with a traditional probit model we could exploit only half of this information.

Because of the follow-up structure of our survey, individuals may fall into one of the following categories: d_i^{yn}, d_i^{yy}, d_i^{ny}, d_i^{nn}, depending on the relevant case for everyone: for example, if one falls in d_i^{yn}, he or she answered "yes" to the first bid and "no" to the second. This way, everyone contributes to the estimation of the WTP for the part of his/her answer that is closer to their real WTP.

Under the assumption of Lopez-Feldman (2012), we regressed the bid variable as in the following equation:

$$BID_{i(z_i, u_i)} = z_i'\beta + u_i \qquad \text{Eq. 1}$$

Where z_i is a vector of explanatory variables, u_i is the error term and β is the vector of estimates from which WTP is computed as

$$E(WTP|\tilde{z}, \beta) = \tilde{z}'\left[-\frac{\hat{\alpha}}{\hat{\delta}}\right] \qquad \text{Eq. 2}$$

Where $\tilde{z}'$ is the vector of values of interest for the explanatory variable, $\hat{\alpha}$ is a vector of constant of the explanatory variables and $\hat{\delta}$ the coefficient for each regressor that captures the amount of the bid.

Table 2 in the next section presents the results of this analysis. We start with a baseline specification with demographic characteristics only, to which we add different sets of covariates to estimate changes in WTP in relation to the perception of specific environmental problems or issues related to the management of the beach.

5. Results and discussion

The WTP estimation was conducted on the total surveyed population as well as in the resident and tourist samples respectively, as we want to highlight any existing difference between tourists' and residents' willingness to pay.

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[3] We present the complete questionnaire in the Appendix

Besides our baseline specification, which includes, sociodemographic variables (age, gender, first time on the beach and length of the holiday) we also took into consideration factors like climate change perception, tourism damage perception, perceived presence of litter and presence of beach facilities and services, as potential factors influencing WTP.

We assessed the WTP of the total sample and both residents and tourists towards three possible management areas, namely beach cleanliness, beach security, and environmental protection. *Beach cleanliness* is a variable equal to 1 if respondents are willing to pay for the implementation of beach and littoral cleaning services and 0 otherwise; the variable *security* collects the interest towards the implementation of beach security services (e.g. additional guard towers) if equal to 1 and 0 otherwise; finally, the variable *environmental protection* is equal to 1 when the preferences expressed is towards the protection of the environment from degradation (e.g. biodiversity preservation) and 0 otherwise.

Results are reported in Table 2. We carried out our analysis on the total sample of respondents and on two restricted samples of tourists and residents' interviewees, to highlight differences in the WTP of these two groups.

Table 2 - WTP estimation results for the total sample (col. 1-3); tourist sample (col. 4-6) and resident sample (col. 7-9)

	Total Sample WTP (€)			Tourists Sample WTP (€)			Residents Sample WTP (€)		
	Beach cleanliness (1)	Security (2)	Environ. protection (3)	Beach cleanliness (4)	Security (5)	Environ. Protection (6)	Beach cleanliness (7)	Security (8)	Environ. Protection (9)
Panel A - Socio- demographic variables									
Socio- demographic variables	6.15	6.35	6.00	6.15	6.68	6.87	5.73	5.90	5.30
Age	11.22	9.70	8.76	11.34	8.08	9.50	11.61	11.42	7.31
Gender	9.87	9.27	7.98	7.28	4.65	5.63	12.83	14.11	10.39
First time on the beach	11.03	9.95	9.23	12.88	10.24	11.38	9.72	9.20	6.55
Length of vacation	11.71	10.39	9.43	11.63	8.85	-	-	-	-
Panel B - Effects of tourism on the environment									
Effects of tourism	4.89	5.00	4.88	5.63	5.26	7.05	4.12	4.53	3.87
Pollution	13.57	12.24	10.97	10.23	8.76	9.20	18.05	17.54	12.44
Natural areas	13.67	12.39	11.27	10.33	10.36	12.82	17.13	15.58	8.59
Resource depletion	8.30	6.35	5.72	5.51	3.79	8.94	12.20	12.16	5.53
Panel C - Climate change perception									
Climate change perception	6.14	6.38	6.08	5.47	5.74	6.81	6.43	6.67	5.30
CC. Human activity	11.50	10.77	9.00	10.46	8.66	10.13	12.42	11.48	6.87
CC. Natural Event	10.30	8.18	7.83	8.22	4.35	7.54	12.29	11.42	7.60
CC. mix of both	6.09	3.44	3.09	6.93	3.35	5.77	7.98	6.65	1.93
Panel D - Presence of waste on the littoral									
Presence of waste on the littoral	13.90	11.56	10.27	7.87	5.68	6.67	9.88	8.73	7.58
Cigarette	12.65	9.05	5.65	9.30	6.70	2.22	6.66	4.63	3.53
Microplastic	11.30	10.75	10.08	8.32	6.86	7.99	11.55	11.23	8.78
Panel E - Beach facilities and services									
Structure/services	9.99	7.80	7.98	9.38	5.65	7.74	10.85	11.11	5.74
Parking	13.18	11.83	11.17	13.95	10.73	11.87	12.69	13.30	8.28
Beach access	8.30	6.36	6.20	7.97	4.10	5.98	8.15	10.10	3.83
Café/restaurant	9.84	7.28	6.52	8.49	4.95	5.64	11.95	10.22	5.46
Sports area	13.92	12.00	12.92	10.08	6.61	9.26	17.50	18.71	13.31

Panel A of Table 2, presents results for our model considering covariates age, gender, beach frequentation, and the length of the holiday. This is our baseline specification, and we note that the first important piece of evidence emerges: the top row shows that tourists are willing to pay a higher amount for environmental protection, while residents would pay more for security services (e.g. implementation of lifeguard services). This can be conducted to the residents' need to create a more secure environment during the entire year, not only during the summer season. Tourists, on the other side, prefer to pay more to maintain a high-quality environment; this is in line with the literature showing that amenities and environmental heritage are considered an integral part of the local experience during holidays (Lohmann & Kaim, 1999).

Residents are more likely to pay for beach cleanliness compared to the other subgroups; this is evident in particular for the variable age. In addition, Table A1 in the appendix shows that age is negatively and significantly related to the bid variable, meaning that younger people are on average willing to pay more due to their higher pro-environmental behaviour as already observed by Carrico et al., (2015) and Klineberg et al., (1998).

Interestingly, we notice that the higher WTP regarding security is found in the resident subsample for women (*gender*, in fact, is a dummy variable that takes value 1 if female), who would pay up to 14.11€ to increase the security of beaches. Moreover, being a female and a resident increase also the WTP for beach cleanliness, with respect to the other displayed in the panel (12.83€). Even though Table A1 in the appendix shows that for the residents' sample, gender is not a determinant of WTP, this increased value could just reflect a higher WTP for residents in general, reinforcing our initial interpretation that residents would pay a higher amount for security and cleanliness.

Panel B of the table collects how the perceived effect of tourism affects WTP in the three samples. These effects are included as an externality in terms of *pollution,* which catches the perception of increment of beach pollution as a consequence of mass tourism, perceived degradation of *Natural areas,* and *resource depletion,* which captures the perception of the increase in resource use for tourism needs. The highest average WTP – first row of Panel B – would be paid by tourists for environmental protection programmes (7.05€), while residents preferred option is to pay more for security programmes (4.53€).

Interestingly, while the WTP of pollution is the highest across the three domains, people are willing to pay more for pollution when this is connected to beach cleanliness (13.57€, 10.23€ and 18.05€ for the total, tourists and residents' samples respectively), with residents being willing to pay 4€ more than the average (total sample), and 8€ more than the tourists. The implication is twofold: on the one side, respondents who live in these touristic areas are more concerned with pollution, especially concerning a clean environment; on the other side, this suggests that a higher value is placed on the short-run effects of a hypothetical program for cleaner littoral and seashores, rather than on the long-run effects of, say, the implementation of a program for local marine flora and fauna preservation.

Similar WTP is found for what concerns natural areas, while WTP drops when turning to resource depletion: on average the total sample as well as both restricted samples, are less interested to pay to compensate for resource depletion from tourism by 5€. This latter result is in line with the results of a few older studies (for example Biel and Gärling, 1995) that show that perception of and behaviours around resource depletion are influenced mainly by constraints on one's individualistic values, coming from group identification, social pressure by group members, rewards and penalties.

Moreover, uncertainty around how other people act and incomplete knowledge of the degree of resource depletion are other factors affecting this specific environmental domain.

Panel C reports how the perception of climate change influences the WTP. We included three dummy variables in this panel: *human activity*, which takes a value of 1 if the respondent believes that climate change is due to human activity only; *natural event*, equal to 1 if the interviewee believes it's only due to natural causes; a *mix of both*, where 1 indicates that the individual thinks human activity and natural causes are equally contributing factors. Across all three samples, respondents who believe climate change is a consequence of only human activity are willing to pay a higher amount in all three areas of environmental management. For example, in the total sample, these respondents would pay 11% more than those who believe it is caused by nature and 88% more than those who believe is caused by nature together with human activity. This implies that different levels of awareness of "having power" to influence climate change positively influence WTP. This result is in line with the literature showing that preoccupation with the environmental situation is not enough to trigger a behaviour change, since the individual needs to feel responsibility and a sense of efficacy before they change their behaviour (Mayer and Smith, 2018; Doherty and Webler, 2016) With regard to the tourist and residents' sample and similarly to the previous cases, we find that beach cleanliness and security are where residents want to pay more when considering climate change perception while tourists are more concerned with environmental protection.

Panel D describes how the perception of a clean beach impacts individuals' WTP. The questionnaire asked to state which are the most common sources of waste the respondent sees on the frequented beach. Among the variety of litter (organic waste, glasses, and paper, to name a few), we found cigarettes and microplastics to be more relevant, especially for residents that present a higher average WTP than tourists. Interestingly, we note that the WTP for tourists is higher when it comes to cigarettes and lowers in relation to microplastics: in terms of awareness, cigarettes are more visible than microplastics therefore a tourist – who only attends the beach for a few days – may perceive this litter as more annoying than smaller litter like microplastics. We believe that in the case of waste, tourists' WTP could mostly be driven by the beach's appearance; indeed, this is the only set of regression where the computed WTP in the environmental protection domain for residents is 0.91€ higher than for tourists.

The last part, Panel E, tests the impact of the presence of facilities and services such as parking, cafés, and sports areas. The WTP mean values in the Table 2 reveal as tourists and residents have two different perspectives. Tourists are willing to pay a lower amount for the environment if the focus is on facilities and services, preferring paying for improving beach cleanliness (7.74€ for the environment vs 9.38€ for cleanliness). On the other side, Residents are more likely to pay for the environment when they rate beach facilities and services high. In other words, the access to structures and facilities contributes to creating a friendly environment for holidays, and by increasing the engagement of both locals and non-locals there is an indirect effect on their will to contribute to improving beach management programmes. Results show that parking and sports area specifically, increases the WTP of both tourists and residents by 10€ on average, with respect to the WTP computed with our baseline model.

6. Conclusions

The purpose of this study was to highlight the existence of differences in WTP between tourists and residents in coastal areas affected by tourism pressure. This paper contributes to the literature that seeks to understand whether and how tourism can be a channel for raising resources to support policies for climate change adaptation and environmental protection. To do so, we proposed a survey to elicit beach users WTP for beach cleanliness, security and environmental protection of two main touristic areas in Italy, namely Marche and Campania littorals, that are annually affected by mass tourism during the summer season. This, combined with the effects of climate change is eroding the equilibrium of ecosystems. The analysis of different managerial areas has reported differences among users' WTP explained by a combination of perception and expectation. The decision to include different management areas assumed that people have different interests in the way in which littorals and holiday destinations have to be managed.

Our results show that there are differences in the perception of the environment and consequently in the willingness to pay tourists and residents. In line with the literature, tourists in our sample are generally willing to pay more for environmental protection than residents, even though this could be related to the willingness to improve their future touristic experience (see for example Dodds et al, 2010). We believe this result allows room for the introduction of local policies (e.g., an environmental tourism tax) to fund local environmental and climate mitigation actions.

Turning to residents, beach cleanliness and safety is a better channel to leverage to involve individuals in seashore management. Our results show that residents are willing to pay a higher amount for keeping order and cleanliness in the place they live and may experience tourism in part as a detriment to the beauty and safety of their nearby littoral.

This study shows that short-term effects on the environment and beauty of the littoral are more valued than long-term effects. We observe that WTP is lower when including resource depletion as a control variable concerning the same value for, say, cigarettes. We believe that since resource depletion is characterized by incomplete knowledge – namely, the effects are less evident and manifest slower in some cases – individuals may struggle to develop a sense of responsibility and efficacy toward this phenomenon. Indeed, the literature has shown that perception of resource depletion is affected by other factors such as constraints on one's individualistic values, group identification, social pressure by group members, rewards and penalties and uncertainty around how other people act around this matter.

Acting on short-term goals is of course the starting point to increased awareness about the main problems related to the territories. Beach cleanliness and environmental protection are interconnected: for example, implementing cleaning services of seashores from cigarettes, plastic bottles and litter implies less waste in the sea and on the beach, contributing to a high-quality environment for tourists and residents during holidays and at the same time to prevent an increase of impact on the marine ecosystem. At the same time, local policy maker could use this opportunity to inform both residents and tourists about other less blatant environmental problems, attempting to educate individuals and increase the awareness of their responsibility. Raising awareness of responsibility could translate from one side into an improvement of citizens' behaviours and on the other an increase in their willingness to pay, thus in a potential increase of environmental policy resources.

In this paper, we were interested also in exploring the beach facilities and services effect, because it is one of the key factors that lead people to choose specific littorals. Results show that access to structures and facilities contributes to creating a friendly environment that engages both

locals and non-locals, that exhibit a higher willingness to contribute to improving beach management programmes. Our findings show, for example, that parking and sports area specifically, increases the WTP of both tourists and residents by 10€ on average, with respect to the WTP computed with our baseline model. Thus, this can be seen as an additional channel for raising resources for environmental policy

7. Appendix

Section A.1 – Example survey

Municipality of:
……………………….
Beach/resort
infrastructure:......................
....
Date:................................

1) Gender ☐ Male ☐ Female   2) Age: ...…............

3)   ☐ Resident   ☐ Not resident   Nationality………………………………….

4)   Is this your first time in this resort?

☐   yes   ☐   no, I usually come here   ☐   no, I've already been here sometimes

5)   With whom are you here? ☐ alone   ☐ partner   ☐ family (with children)   ☐ friends   ☐ someone else

6)   Why have you mainly chosen this resort? (just one answer)

☐ sea/beach	☐ good quality of services/facilities (bar, showers, beach huts, etc.)	☐ cultural heritage (handicraft/folklore/cooking)
☐ nature and landscape	☐ relax/quiet	☐ have a holiday home
☐ close to home	☐ parking	☐ safety
☐ other (specify)…… …		

7)   How long will you stay in this resort (locality)?   ☐ only today   ☐ from 2 to 7   ☐ from 8 to 15 ☐ more than 15

8)   What are climate changes?

☐ polar ice melting
☐ global temperature raising
☐ changes in global weather patterns

9)   What causes climate changes?

☐ anthropic activities
☐ natural phenomenon/factors
☐ both anthropic activities and natural phenomenon

10)   What are the main effects of climate changes? (only 2 answers)

☐ average global temperature rise	☐ more coastal erosion phenomenon
☐ more frequent storms/floods	☐ pollution
☐ loss of ecosystems / habitat / fauna and flora	☐ flooding / losses of coastal environments
☐ soil/groundwater salinization	☐ increase of fire
☐ economic impacts (tourism, fisheries,..)	☐ migration of autochthone species

☐ sea level rise	☐ other (specify)………………………………..

11) In case that a financial fund is constituted in order to ensure the appropriate beach management of,
Are you willing to pay **2 €** (per person) each season in this territory? (If yes, please tick the following boxes to express your opinion):

☐ sea and beach cleanliness	☐ yes ☐ no
☐ safety	☐ yes ☐ no
☐ services/facilities	☐ yes ☐ no
☐ environmental protection	☐ yes ☐ no

☐ coastal protection (coastal defence interventions)	☐ yes ☐ no
☐ other (specify)………………………………….. ……………………………………………………………… ……..	☐ yes ☐ no

• *if YES*, would you also pay 4 €?   ☐yes   ☐ no

• *if NO,* would you pay instead 1 €?   ☐ yes   ☐ no

12) **If you agree with** the previous question (yes), how would you prefer to pay (just one answer)

by a local tax	☐
a box to put contributions into	☐
paying a fixed price per visit	☐
a car parking charge	☐
by doing voluntary works	☐
other means	☐

13)   What are the main tourism effects on the environment? (from 0 absent from 5 high value)

pollution	0	1	2	3	4	5
natural area changes	0	1	2	3	4	5
coastal anthropization and hardening	0	1	2	3	4	5
soil losses	0	1	2	3	4	5
traffic	0	1	2	3	4	5
biodiversity losses	0	1	2	3	4	5
excessive resource consumption (water, energy ...)	0	1	2	3	4	5
coastal dunes degradation	0	1	2	3	4	5
loss of local cultural identities	0	1	2	3	4	5

14)   Are litter or waste present in the beach?   ☐ yes   ☐ no
If YES, how many are there? (from 0 absent from 5 high value)

organic litter (algae, wood, shells)	0	1	2	3	4	5
discarded cigarette	0	1	2	3	4	5
glass bottles and cans	0	1	2	3	4	5
plastic	0	1	2	3	4	5
paper	0	1	2	3	4	5
metal	0	1	2	3	4	5
rubber	0	1	2	3	4	5
mixed litter	0	1	2	3	4	5
other	0	1	2	3	4	5

15)   What are the main litter/waste sources? (tick 2 boxes)

☐ sea	☐ rivers	☐ maritime traffic
☐ fisheries and aquaculture	☐ uncontrolled wastewater discharge	☐ other (specify)………...............................
☐ tourism	☐ human	………………………………………………………

16) According to your opinion, is the dispersion of small plastic items (microplastics) in the sea harmful for human and environment? ☐ yes ☐ no

17) What are the litter/waste impacts on the littorals?

☐ health/diseases	☐ poor seawater quality	☐ poor beach quality
☐ bad smell	☐ pollution	☐ increase of insects/mice
☐ loss of tourists/visitors	☐ other (specify)……..	

18) How do you rate equipment/facilities for surveillance/safety on the beach? (from 0 absent to 5 excellent).

surveillance	0	1	2	3	4	5
safety	0	1	2	3	4	5
drowning danger	0	1	2	3	4	5
presence of holes on the sea floor	0	1	2	3	4	5
presence of dangerous structures	0	1	2	3	4	5
presence of strong marine currents	0	1	2	3	4	5
presence of lifeguard towers	0	1	2	3	4	5
first aid kits	0	1	2	3	4	5

19) How do you rate services/aspects/structures on the beach? (from 0 absent from 5 excellent).

parking	0	1	2	3	4	5
beach access	0	1	2	3	4	5
beach smell	0	1	2	3	4	5
crowding	0	1	2	3	4	5
bar and restaurant	0	1	2	3	4	5
toilets	0	1	2	3	4	5
sun beds/umbrellas	0	1	2	3	4	5
sport/fun	0	1	2	3	4	5
recreational activities	0	1	2	3	4	5
quality/price	0	1	2	3	4	5
comfort on the beach	0	1	2	3	4	5
separate waste collection	0	1	2	3	4	5

20) What value do you attribute to safety? ☐ high ☐ medium ☐ low

21) Have you ever read a bathing ordinance? ☐ yes ☐ no

22) What are the principal dangers/threats on the beach (in any beach)?
☐ holes ☐ glass/can ☐ deep sea ☐ other_____

23) Who should guarantee the beach safety? ☐ lifeguard/Baywatch ☐ beach operator ☐ municipality ☐ traffic wardens ☐ other_____

24) Do you know the safety signals? ☐ yes ☐ no

25) How the beach hazards are communicated from baywatch to the users? ☐ flags ☐ acoustic signals (whistle) ☐ alert with loudspeaker ☐ word of mouth ☐ other_____

26) Do you know the meaning of the flag? **red** ☐ yes ☐ no **yellow** ☐ yes ☐ no **white** ☐ yes ☐ no

27) What the red / orange buoys delimit in the water? ☐ safety zone for swimming ☐ zone where boats are prohibited ☐ diver's presence ☐ other_____

28) Should a baywatch service be present in free beaches, like in (private) beach establishments? ☐ yes ☐ no

29) Do you know some first aid technics? ☐ yes ☐ no

30) Do you personally know the baywatch of this beach? ☐ yes ☐ no

Is the baywatch only responsible for the safety management of the beach? ☐ yes ☐ no

31) Do you think surveillance is important during the bath? ☐ yes ☐ no

32) What value do you attribute to heart defibrillator machine on the beach? ☐ high ☐ medium

☐ low

Table A 1 - DB model regression results

Group	Control variables	Total Sample	Resident Sample	Tourist Sample
		Significance (S.E.)	Significance (S.E.)	Significance (S.E.)
Socio-demographic variables	Age	-0.0859*** (0.0238)	-0.0924** (0.0378)	-0.0623** (0.0298)
	Gender	-1.048 (0.718)	1.298 (1.128)	-2.882*** (0.911)
	First time on the beach	0.237 (0.469)	-0.839 (0.773)	1.445** (0.575)
	Length of vacation	0.0993 (0.327)	0.208 (0.484)	0.00975 (0.440)
Perception of the effects of tourism on the environment	Pollution	2.444*** (0.786)	2.510** (1.259)	2.764*** (0.969)
	Impact on natural areas	2.019** (0.946)	0.531 (1.510)	2.870** (1.151)
	Resource depletion	-1.584* (0.818)	-1.534 (1.413)	-1.098 (0.974)
Perception of climate change	CC. Human activity	5.133** (2.525)	3.640 (3.387)	5.059 (3.686)
	CC. Natural Event	3.997 (2.630)	1.484 (3.497)	4.987 (3.855)
	CC. mix of both	0.322 (1.028)	0.437 (1.305)	0.212 (1.556)
Perceived presence of waste on the littoral	Cigarette	-1.957** (0.931)	-4.294*** (1.445)	-1.795 (1.201)
	Microplastics	-0.766 (1.557)	16.01*** (4.425)	-1.941 (1.884)
Perception of the quality of beach facilities and services	Parking	1.873** (0.831)	3.335*** (1.033)	0.392 (1.335)
	Beach access	-2.329*** (0.820)	-1.473 (1.001)	-3.645*** (1.324)
	Café and restaurant	-1.703** (0.845)	-1.847* (1.026)	-0.685 (1.429)
	Sports	1.933* (1.103)	0.944 (1.272)	2.061 (1.944)

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