

Evaluation of the recreational use of Barcola beach in Trieste (Italy)

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Abstract

This paper focuses on the economic evaluation of the recreational use of Barcola seafront in Trieste (Italy). Within the EU DELOS (2000) framework a contingent valuation survey in the value of enjoyment version was carried out in order to estimate the gain for a project of building a new artificial beach on the Barcola seafront. The project satisfies sustainable tourism development. Evaluation questions not only about the beach use in spring/summer but also in autumn/winter were included in the questionnaire. The survey results show that the beach use value changes for different seasons. In addition, the hypothetical new beach would attract new visitors.

Keywords: cost-benefit analysis, contingent valuation method, value of enjoyment, beach recreational activities, coastal sustainable development, integrated coastal management.

1 Introduction

This article presents results of the economic valuation of recreational benefits due to a project of beach expansion on the Barcola seafront in Trieste (Italy). The project is justified by the need to satisfy the demand for beach recreational activities of local residents within a sustainable development framework. This study deals with the economic valuation of informal recreational benefits due to this project. The European Union (DELOS 2000) and the City Council of Trieste supported this research.

Informal recreational activities such as sunbathing, swimming and walking are non-marketable values, and represent *use values*. Cost-benefit Analysis requires non-marketable values to be estimated. As regards recreational



activities, the Travel Cost Method (TCM) and the Contingent Valuation Method (CVM) can be applied. They are based on the simple idea of asking beach visitors specific questions by means of a survey, and the practical difficulty of their application lies in obtaining rational and consistent expressions of value from the relevant population. In addition, because carrying out a valuation survey is time-consuming and very expensive, the procedure of the Benefit Function Transfer (BFT) is suggested, whereby the value of an improvement of beach quality, obtained from a set of study sites, is generalised to other empirical situations (policy sites). One of the main problems of the BFT is that benefit transfer studies do not always yield valid and reliable estimates. The use for a new site of benefits *transferred* from other studies regarding other sites must respect some basic criteria. We mention the following: i) non marketable goods need to be the same (for example coastal recreational activities depends on the characteristics of the beach – sand or stones, large or narrow – on the quality of the sea water, weather conditions, facilities on/near the beach, and so on); and ii) population characteristics should be similar for the policy and study sites (Boyle and Bergstrom [2]; Desvousges *et al.* [3]).

We found no application of evaluation methods to sites very similar to the case-study of Trieste, and therefore the transfer of benefits from other sites to this Italian site was not possible. In order to quantify non-marketable use values about the Barcola seafront before and after the implementation of the project, a specific interview survey was carried out. The main aims of this survey were: i) to evaluate the enjoyment of a daily use of the seafront in its current condition in spring/summer and in autumn/winter; ii) to evaluate the gain after the expansion of the beach in spring/summer and in autumn/winter; iii) to collect information on type, frequency and duration of use of the Barcola beach, and on the social characteristics of respondents. The distinction of the beach use according to seasons is justified by the fact that weather conditions are very different in Italy in autumn/winter and spring/summer, and this difference influences beach use and value.

2 Methodology

Given the need for a new survey, the TCM cannot be applied to this site. The Barcola seafront is used mainly by residents, and the cost of travelling may be very low or even zero. For this reason the cost of the distance travelled to visit Barcola cannot be considered the value of the recreational activities. The CVM was, instead, applied. This technique aims to create a hypothetical market which permits respondents to express non-marketable use value for the environmental change considered in that site by means of a survey. Each respondent expresses a value which is contingent to the hypothetical scenario created within the survey.

The CVM philosophy, generally known in the version of the willingness to pay (WTP), is: “ If you want to know what something is worth, go to those who might value it and ask: ‘what are you *willing to pay* for it?’” (Price [8]). This procedure can obviously also be used to evaluate damages. An other version of the CVM philosophy focuses on the *value of enjoyment* (VOE), and the question



may be: “What value do you put on your enjoyment of a daily visit to ...?” (Penning-Rowsell *et al.* [7]). A comparison between WTP and VOE, highlights that the former, unlike the latter, requires specification of a payment vehicle, such as tax, entry charge, rate, voluntary donation and so on. As regards Barcola seafront, the CVM in the WTP version was considered unsuitable because any payment vehicle about the recreational use of Barcola seafront would have been unpopular. Therefore, the VOE approach for beach management was applied. It allows estimation to be made for each individual of the value he/she attributes to the enjoyment obtained from a daily visit on the beach. Because the unit of measure for the valuation is the *recreation day* on the beach, the number of visits is considered as the quantity consumed of beach services.

According to whether the seafront change is considered an improvement or a worsening of the present state respectively, the gain or loss after the beach expansion can be computed. Penning-Rowsell *et al.* [7] distinguish beach visitors in those who continue to visit the site and those who would visit an alternative site. If people continue to visit the beach after the project implementation, the gain (loss) per visit (D) is the difference between the VOE of a visit after the implementation of the project (Vp) and the VOE of a visit in the current condition (Vs), i.e. for each individual

$$D = Vp - Vs \quad (1)$$

Nevertheless, after the implementation of a project, individuals may visit other sites because they dislike the change. When people visit an alternative site, the gain or loss per visit is the difference between the VOE at the site in the status quo and the VOE at the alternative site plus the possible increase in the cost of the visit to the new site, i.e. for each individual

$$Da = (Vs - Va) + (Ca - C) \quad (2)$$

where Da is the gain, or loss, Va the VOE in the other site, Ca the cost per visit in the alternative site, and C the cost per visit in the status quo. Finally, in order to test if after the project implementation the total benefit per year is increased, the aggregate gain (loss) is estimated:

$$B = N q_m D_m \quad (3)$$

where B is the total annual gain (loss), D_m the mean gain (loss) per adult visit, Nq_m the total annual number of beach use days obtained multiplying the total relevant population of the site N by the individual mean number of visits per annum q_m .

3 The project of building a new artificial beach on the Barcola seafront

Trieste is a town in the North-East of Italy of almost 235,000 inhabitants, located on the Northern Adriatic Sea and close to the border with Slovenia. The Barcola site involves a strip of the coast between Miramare castle and the town of



Trieste, 2400 mt long. Viale Miramare, the road that forms the inland boundary of the reinstatement area, was built following the profile of an old abrasion terrace formed by the action of the waves. The Barcola promenade is defended from the sea by an artificial wall that protects the road and pedestrian paths. The Barcola coastline is divided into two different areas: the first includes yacht and canoe clubs, a small pinewood, and the small harbour of Barcola; the second includes the area for sunbathing, consisting of concrete changing-rooms (topolini), a very small pebble beach and the small Cedas harbour.



Photograph 1: Barcola beach in the present state.

The second area may be changed to satisfy the increasing demand from residents for recreational activities because the Barcola beach is very crowded in spring/summer, as shown in photograph 1. The City Council of Trieste sent us a scientific report (2000) describing the characteristics that a project has to satisfy to avoid major damages to the Barcola environment and to the current use of the seafront for recreational activities (Brambati [1]). According to these guidelines, the project of beach expansion, selected by a public competition, consists of the building of two artificial beaches, each 400 m long and 40 m wide (see photomontage 1).

4 The CVM survey design

In October – November 2002 a CVM survey of 600 interviews (random sample of people aged 18 plus) was carried out in the town of Trieste. The Barcola seafront is exclusively visited by residents, therefore face-to-face interview were done at home in order to assess the recreational use of the beach; in this way, not



only the current use of the beach, but also the potential new use after the change to the coast was estimated.



Photomontage 1: Simulation of the Barcola seafront after the beach expansion.

Interviews were done by a market research firm. Anonymity was guaranteed in order to avoid strategic behaviour. Face-to-face interviews were justified by different reasons: the need to motivate respondents to cooperate fully; the need to provide a better explanation of the scenario described in photomontage 1; and the need to help the respondent to understand the unusual evaluation questions.

The standard resident questionnaire included in Penning-Rowsell *et al.* [7], Appendix 4.2 (b), was adapted to the Barcola seafront characteristics. The main innovation is the inclusion of evaluation questions about the beach use not only in spring/summer but also in autumn/winter. This is justified by the fact that weather conditions are very different in Italy in these seasons: very sunny and hot in spring/summer, and cold and windy in autumn/winter. In its final wording the questionnaire is divided into sections. The first section contains questions of a general nature regarding the respondent's general opinion about the quality of life in Trieste. The second section seeks information on attitudes toward the beach (daily visit), whilst the third section investigates the respondent's familiarity with the seafront including questions about the number and duration of visits to the Barcola beach, the type of recreational activity undertaken and

means of transport. The fourth and fifth sections are the heart of the questionnaire since they include the evaluation questions. Respondents were first asked how much they evaluate the recreation activities of a daily visit to the Barcola seafront in the present conditions, then whether they would have an increase or a decrease in enjoyment from the expansion of the beach after the project implementation and then were finally asked to elicit the daily use value of the new artificial beach. These values were elicited for spring/summer use and also for autumn/ winter use of the seafront. Questions to identify protest answers are also included here. In the sixth section all respondents are asked to say whether or not they are in favour of the implementation of the new artificial beach. Those respondents who do not agree with the project are asked to evaluate the use of an alternative beach. The last two sections enquire about the respondents' socio-economic characteristics, and the interviewer's opinion on the respondents' comprehension of the questionnaire. Most of the biases that may occur in a CVM survey are related to the questionnaire structure, so a pilot survey of 50 interviews was carried out to test the questionnaire before conducting the main survey.

5 Empirical results

The majority of respondents, mainly young and middle-aged people, generally consider the Trieste seafront highly important. More specifically, 57% of respondents think that it is the right place for recreational activities; its mean rating is 7.6 on a scale from 1 to 10, with only 11% of respondents giving a rating lower than 6.

In spring/summer the majority of Trieste residents (63.8%) go to the Barcola seafront. The average number of days spent on the seafront is 23.5 days (Std. Deviation 23.2). Respondents stay on the seafront a mean time of 161.7 minutes (Std. Deviation= 79.4) per day; 76.2% of respondents usually go to the Barcola seafront in groups, and 40.8% of the groups include boys or girls under 15 years of age. The main activities done on the Barcola seafront in the present state are walking, sunbathing, jogging and swimming.

In autumn/winter the seafront is visited by a highest number of respondents (73.5%), and the mean number of days is 18.3 (Std. Deviation = 23.3). The main activities are walking and relaxing. Respondents spent a mean time of 105.8 minutes (Std. Deviation = 52.9) on the Barcola seafront.

As regards the hypothetical expansion of the beach, the great majority of respondents are in favour of the implementation of the project, and 81% of respondents would visit it; young residents are more in favour than older residents. A significant percentage (65.8%) of these people claim that, if the beach was actually extended, they would visit it more or much more, and 4.5% less or much less often. 19% of respondents would not go to the extended beach. Since the Barcola seafront has alternative beaches near Trieste, 3.83% of respondents would go to another beach if the new beach is built (see also Marzetti [4]).



5.1 Daily beach use values

As regards the present state (table 1), in spring/summer the mean daily use value of the Barcola seafront is 5.24 € (Std. Deviation 7.66, median 2.00 and mode 0.00), and in autumn/winter it is 5.25 € (Std. Deviation 7.97, median 2.00 and mode 0.00). In spring/summer 35.8% of respondents do not visit the Barcola beach and elicited 0.00 €, and in autumn/winter 26.5% of people elicited zero values. Extreme values (0.2% spring/summer, 0.5% autumn/winter) higher than 100.00 €, protest responses (3.5% both seasons) and non-responses (7.7% both seasons) were excluded from the mean computation.

Table 1: Mean use values (Euros) according to different seasons – Present state.

Mean value (median)	Present state
Spring/summer	5.24 (2.00)
Autumn/winter	5.25 (2.00)

80.2% of respondents declared their household income bracket, and people with the highest incomes elicited lower mean use values than people with lower income.

5.2 Gain and loss after the beach expansion

As regards the beach change, the great majority of respondents would get more enjoyment and only 2.9% of interviewees would have a reduction in the daily enjoyment. The mean gain for the project of building a new artificial beach on the Barcola seafront has been computed according to equations (1) and (2).

Table 2: Expanded beach: daily mean gain and loss (Euros).

Mean value (median)	Spring/summer	Autumn/winter
Whole sample	3.07 (1.00)	1.39 (0.00)
Alternative beach*	- 2.60	- 2.04
Same beach*	3.40	1.56
Potential visitors	6.04	3.60

[* ‘Alternative beach’ means that people would go to another beach, and ‘same beach’ that they would not go.]

Table 2 shows that, considering the whole sample, if the new beach project is implemented, respondents would have a mean gain in both seasons; while those who would go to an alternative beach in the vicinity of Barcola seafront (5.25% of respondents) would have a daily mean loss. The reason is that the majority of



people who would not visit the new beach evaluate a daily visit to the alternative beach as equal to that of the Barcola seafront in the present state, but they would pay more for the transport. People who would continue to visit the Barcola beach, if the new beach is built, would have a mean gain of 3.40 € in spring/summer and 1.56 € in autumn/winter. In addition, potential visitors - respondents who do not visit the Barcola seafront in the status quo, but would visit it if the new beach is built - are 18.67% of the whole sample in spring/summer and 12.5% in autumn/winter, and they would have a mean gain of 6.04 € in spring/summer and 3.60 € in autumn/winter.

Finally, according to the equation (3), the aggregate annual recreational value of the beach change is of the order of 1 million Euros.

6 Conclusions

This research confirms that, in order to satisfy the need of recreational activities, an artificial beach expansion is considered an improvement of the Italian coast (see also Marzetti & Lamberti [5]; Marzetti & Zanuttigh [6]). The Barcola project would increase the number of beach visits and also would attract new visitors. The use value of a daily beach visit would also increase. In addition, this CVM survey show that it is useful to distinguish the mean gain of enjoyment according to seasons; as regards the expanded beach, in spring/summer the mean gain is more than 50% higher than in autumn/winter.

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Authors' contribution

Marzetti Dall'Aste Brandolini S. dealt with the economic valuation of the beach use; Lamberti A. with the engineering aspects of the research.

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