



A combined assessment of beach occupancy and public perceptions of beach quality: A case study in the Costa Brava, Spain

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ABSTRACT

The main objective of this paper is to present an approach that contributes to evaluate beach quality based on a combined analysis of beach occupancy and the perception of beach users. The study area is a major Mediterranean tourist destination in NE Spain. Six beaches that fulfilled different environmental and social criteria were assessed. Sampling took place during 2004 and 2005. An analysis of beach occupancy showed that highly accessible urban beaches suffer the most from overcrowding. A comparison of the two approaches (occupancy and perception) indicates that a higher sand availability increased user satisfaction, although not as much as might have been expected because other parameters are also highly relevant in evaluating beach quality from the perspective of beach user such as physical characteristics, landscape and facilities.

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1. Introduction

The boom in the popularity of the Mediterranean coastline has been relatively recent. It was not until the 19th century that its beaches stopped being considered of exclusive relevance to the marine industry (fishing, shipyards) and became attractive locations for recreation and tourism. This growth in popularity is primarily linked to the discovery of thalassotherapy, which attracted the first wave of visitors to the area. The suntan, which became popular towards 1920, was an even more prominent pull factor in attracting visitors to the area and, by the second half of the 20th century, the Mediterranean coastline had become one of the most popular tourist destinations of the time [1].

This influx of tourism and recreational activity to Mediterranean coastal regions marked the beginning of a period of rapid economic development, especially in NE Spain. However, it also brought intensive urban growth and put pressure on natural resources, dramatically transforming the area.

Coastal tourism often generates a variety of problems, resulting in an imbalance between sand availability and demand; the overcrowding seen during the summer months is an example of this. If

a resource – in this case the beach – suffers degradation the quality of the visitor's experience is consequently diminished [2].

This scenario demonstrates the need to analyse beach attendance, which would provide valuable information for coastal management and be useful in the planning and dimensioning of beach services. Similarly, recreation patterns could be determined using data on the number of beach users and would be used to estimate both the degree of anthropogenic pressure on the beach and the environment's carrying capacity. The concept of the recreational carrying capacity of beaches and its physical, social and ecological dimensions are described in the existing literature [3–7].

In addition to being a quantitative approach, an assessment of beach attendance must incorporate alternative perspectives [8] related to social factors, i.e., public perception. In this way, public perception studies provide information that enable researchers to understand the interests, demands and motives of local stakeholders and beach users. This provides a bottom-up perspective in beach management. Several studies on public perception in coastal areas have been carried out, some of which are particularly significant, such as Refs. [8–14].

Traditionally, physical and biological parameters were included in beach quality evaluation. However, the increasing importance of recreation and tourism requires new procedures for evaluating beach quality. It is therefore essential that social aspects such as beach occupancy and users perceptions be integrated into management plans to guarantee beach user satisfaction.

The main objective of this paper is to present a methodology that contributes to evaluate beach quality based on a combined analysis of beach occupancy and public perception. The Costa Brava,

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a major coastal Mediterranean tourist destination in NE Spain, was selected as a case study. The beaches in this area are good examples of natural environments that have undergone transformation as a result of recreational activities. The results of this paper are therefore applicable to areas whose characteristics are similar.

2. Study area

A total of six beaches in the north-eastern region of the Catalan coast (Spain) were selected for applying the methodology: Malgrat Nord Beach in the municipality of Malgrat de Mar, the northern sector of the S'Abanell Beach in Blanes, Santa Cristina – Treumal, Lloret and Canyelles in the municipality of Lloret de Mar, and Tossa Beach in Tossa de Mar (Fig. 1).

Blanes, Lloret de Mar and Tossa de Mar form the southern part of the well-known Costa Brava (although the municipality of Malgrat de Mar is adjacent to Blanes, it belongs to the Costa del Maresme).

This southern part is an eminently tourist destination because of the wide range of existing beaches, the quality of the landscape, the desirable climate and its strategic location in relation to other European countries. These factors have made this area one of the most important tourist destinations in the Mediterranean.

Although the sample areas are located very close to each other, they differ significantly in several aspects, such as the size or extension of the beach and the level of development. The latter is related to the type and level of urbanisation of the immediate surroundings of the beach (see Table 1).

Urban beaches, which are located beside existing urban spaces or recently created tourist resorts, are the most affected by tourism. They are characterised by continuous and intensive urbanisation of the whole seafront and its immediate surroundings. The beaches of Lloret, Tossa and the northern part of the S'Abanell beach belong to this category. These three beaches typically have a high level of artificiality and beach occupancy. This is a consequence of location,

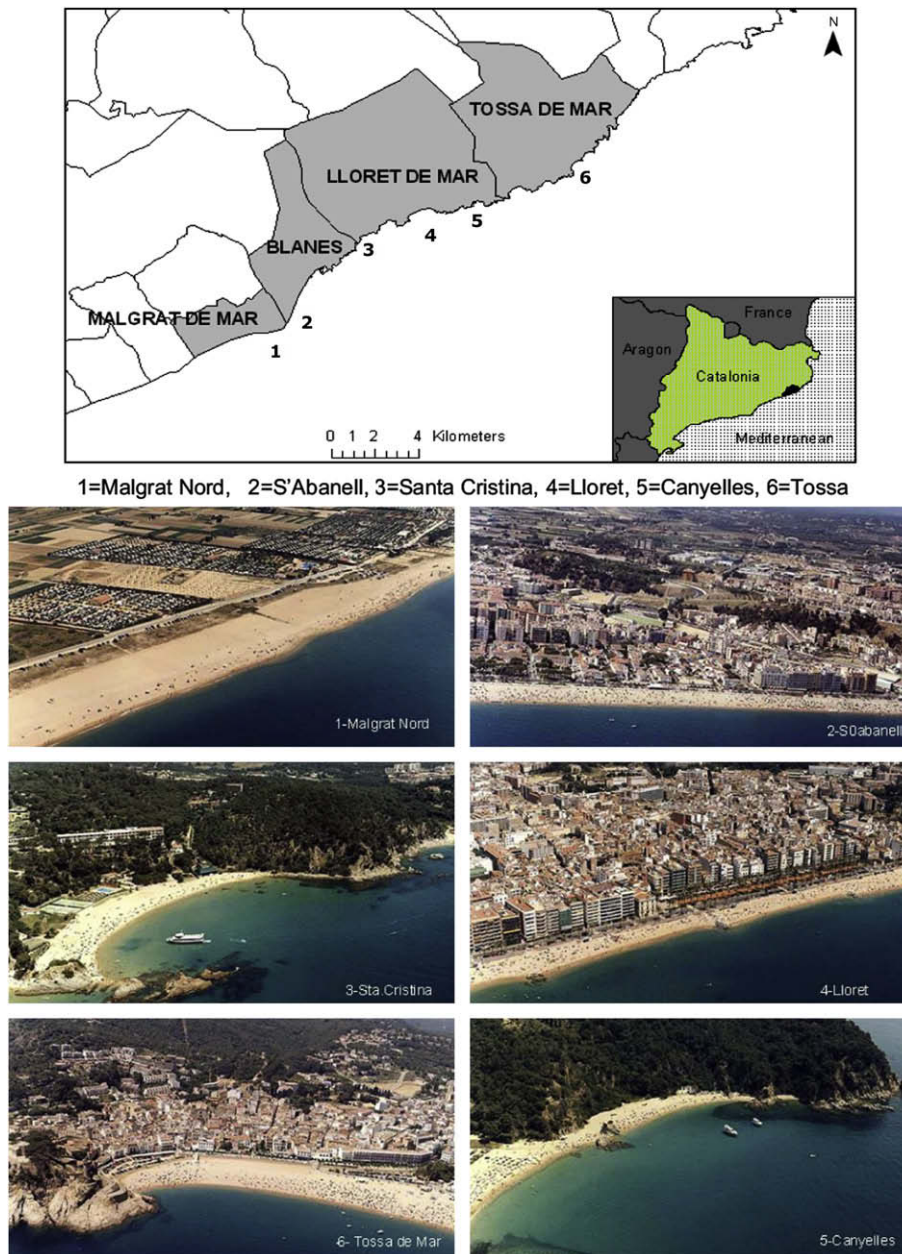


Fig. 1. The study area and views of selected beaches.

Table 1

The main characteristics of the study areas, 2007

Beach	Municipality	Length (m)	Surface (m ²)	Beach type	Facilities
Malgrat Nord	Malgrat de Mar	1300	42,185	Semi-natural	Non-equipped
S'Abanell	Blanes	2500	69,582	Urban	Full-equipped
Santa Cristina	Lloret de Mar	450	13,431	Semi-natural	Semi-equipped
Lloret	Lloret de Mar	1300	50,220	Urban	Full-equipped
Canyelles	Lloret de Mar	450	9942	Semi-natural	Semi-equipped
Tossa	Tossa de Mar	650	24,115	Urban	Full-equipped

which results in a high potential demand from the communities in the immediate vicinity; they are very easily accessed and have a wide range of beach and restaurant facilities.

The beaches of Canyelles and Malgrat de Mar Nord are described as semi-natural, i.e., they are located a certain distance away from the town centre but have good accessibility. A semi-natural beach typically has natural elements, although they are fragmented, and it is generally linked to second residence housing developments or other types of tourist accommodation, e.g., hotels and campsites.

Santa Cristina – Treumal is the best preserved beach of all the study areas. Despite a few isolated constructions, the natural elements are predominant and the environmental aspects are generally of good quality. Even though access to it is difficult (there is no vehicle access and the foot path is on a steep slope), there are good parking facilities nearby and the quality of the landscape is high, making it a very popular beach.

3. Methods

Firstly, the level of congestion or crowding was quantified by collecting data of beach occupancy during episodes of maximum use. These data were compared with estimated optimum values for recreational carrying capacity.

Secondly, a user profile was established for each beach and the level of satisfaction in terms of recreational experience and public perception was assessed. To do this, an opinion poll was conducted at each beach: users were asked to evaluate physical and environmental aspects, as well as those related to beach facilities, layout and the degree of comfort.

Finally, the results of the two approaches were combined to identify any correlation or pattern between beach occupancy and public perception.

3.1. Beach occupancy analysis

Beach occupancy was analysed by direct observation. Visitors were counted within 30 m wide plots distributed at regular intervals along the entire extension of the beach. The number of users within the delimited plots and the adjacent water area was recorded.

Counts were conducted in August 2004 and 2005 on two non-working days with good weather conditions (sunshine, moderate to high temperatures and an absence of strong winds). Counts took place during the hours of highest beach occupancy of each of the beaches. The data for hours of occupancy were taken from previous research on the same beaches [15] and were combined with data from the present study.

In order to compare results between beaches, units of sand availability (m²/user) were defined. The available sand surface of the different counting strips and beaches was determined using GPS, excluding areas deemed unsuitable for sunbathing or recreational activities (i.e., margins, dunes, etc.) or those occupied by beach facilities. To account for any variations in the surface

characteristics of the beach from one year to another, this procedure was repeated for the two counting years.

Mean sand availability for the whole beach was calculated from the sand availability of all the plots on each beach, for each of the counting days. The total available beach surface for each beach was used to extrapolate the total number of users (total beach surface/ beach mean sand availability = number of users).

The results for mean sand availability were later related to recreational carrying capacity thresholds proposed by different authors for Mediterranean beaches (Table 2). Despite the existing variability, most authors suggest standard values of between 4 and 6 m²/user for urban beaches subject to high use and above 8–10 m²/user for those linked to higher-class accommodation values. In the case of natural beaches, values of 10–15 m²/user or even higher (25 m²/user) are suggested.

3.2. Public perception survey

Data was collected on public perception using two complementary approaches discussed in the literature [12–14]. Firstly, a questionnaire was conducted on beach users. Simultaneously, the beach characteristics were directly observed and recorded on a checklist that was used as an objective reference for current beach conditions at the time of the survey. The second method was an in-depth interview. A set of semi-structured interviews were conducted on the local community, including local authorities, economic sectors, and social and ecological associations.

The questionnaire had two parts. In the first part, the respondents were asked to give a score of between one and ten to a set of 50 parameters according to their degree of satisfaction. These parameters were organised into four categories: physical and morphological aspects, environmental characteristics, facilities, and design and comfort. The section on physical and morphological aspects was related to beach morphology: sand colour, texture and

Table 2

Recreational carrying capacity thresholds proposed by the literature

Reference	Minimum recommended sand availability (m ² /user)	Users/100 m ²
Spain		
MOPU [16]	4	25
Alemanya [17]	5	20
Blàzquez [18]	7.5	13–14
Roig [6]		
25	Virgin beach	4
15–10	Natural areas of special interest	6,7–10
5	Urban beaches	20
Yepes [4]		
4	Acceptable limit	25
5	Acceptable	20
>10	Comfortable	10
Mediterranean		
Piperoglou, 1996 ^a	20	Small bay – high cost accommodation
	10	Large bay – Medium cost accommodation
	6	Long bay – Low cost accommodation
United Nations		
	8	High cost accommodation
Priority actions programme [20]	6	Low – medium cost accommodation
Andric et al., 1972 ^a	5	20
An Foras Forbatha, 1973 ^a	10	10
ACAU, 1967 ^a	16.67	6
Languedoc-Roussillon ^a	16.67	6

^a In Pearce [19] p. 37.

temperature, beach width, slope, access to the water and the sea swell. The environmental characteristics incorporated important biological aspects, i.e., the presence of fish, algae and vegetation. The beach was also rated on the environmental quality of the most visible areas of the beach. For example, the beach was assessed on pollution in the water and sand, and on its general maintenance and cleanliness. This category also included noise pollution and pollution from rainwater drainage.

With regard to facilities, efforts were made to improve quality, comfort and user satisfaction were evaluated; because there were lifeguards and items for hire (e.g., parasols, deckchairs, tables, sailing and motor boats, etc.) this category was more effectively assessed. Additionally, respondents were asked to evaluate the planning of the area, i.e., recreational areas and organised activities, parking zones, beach access, the seafront, etc. Finally, design and comfort was measured by overall user satisfaction based on the aesthetics of the landscape, the level of comfort, noise levels and the quality/price ratio [13].

The second part of the questionnaire consisted of data classification, whereby basic information from the respondent was collected to create a user profile and to describe the main characteristics of beach use. The information classified included age, sex, profession, habitual place of residence, distance travelled to the beach, information regarding accommodation, frequency of visits, transport to the beach, companions and reasons for visiting the beach in question.

The checklist was an extensive inventory that incorporated the characteristics of the study areas. Fifty parameters also present in the questionnaire were collected for the checklist by direct observation of the surroundings. The checklist was completed at the same time as the questionnaire, and any variations observed, both random and seasonal, were highlighted. Another component of the checklist was the photographic report, which was carried out when the beach was deserted.

The questionnaire was conducted on a randomly selected group of people on each beach during a peak season weekend. Throughout the bathing seasons of 2004 and 2005, 590 questionnaires and 12 checklists were conducted. Furthermore, approximately 40 in-depth interviews were performed on the local community, politicians, local authorities, socioeconomic actors and social bodies (e.g., the Red Cross, neighbourhood associations, conservationists and environmentalists, etc.).

The 42,000 responses to the 590 questionnaires were analysed using SPSS v.14 software for graphic and numerical statistical analysis. The quantitative results were interpreted and then compared with the qualitative information obtained from the in-depth interviews.

4. Results and discussion

Maintaining the double perspective of the article, this section offers in first place the results of the study of beach attendance; next, the description of the beach user profiles and perceptions. Finally, the interaction between beach occupancy and public perception is described.

4.1. Results of beach occupancy survey

For each study area, the mean beach sand availability (mean value of the two counting days), the minimum and maximum sand availability obtained in anyone of the counting plots and the total number of beach users (mean value of the two counting days) are presented in Table 3.

The results show that there are clear differences between the six study areas. Lloret and Tossa had the lowest mean sand availability (4.83 and 5.16 m²/user, respectively). These results are very close to

Table 3
Results of the beach occupancy study

	Mean sand availability – whole beach (m ² /user)	Minimum sand availability obtained in a counting plot (m ² /user)	Maximum sand availability obtained in a counting plot (m ² /user)	Number of users – whole beach
Ma	34.20	19.09	47.94	1311
Bl	8.15	4.62	14.26	5558
Sc	11.33	4.36	23.14	1292
Ll	4.83	2.14	8.44	10,946
Ca	12.57	7.71	28.35	852
To	5.16	3.24	8.95	4816

the threshold carrying capacity for urban beaches (between 4 and 6 m²/user, depending on the author), which indicates that the carrying capacity for these beaches was almost exceeded.

Although the congestion levels of the two beaches are similar, it is important to highlight that the total number of users in absolute values for Lloret Beach, which was 10,946 users at peak times, is almost double that of Tossa Beach. This is due to differences in the beach surfaces between the two study areas, Tossa being the smallest and therefore having a more limited user capacity.

In the case of the Lloret de Mar beach, the minimum value of sand availability obtained in a counting plot (2.14 m²/user) is particularly significant because it is indicative of the saturation scenario reached on some parts of the beach, where sand availability per person is clearly insufficient to allow users to lie down comfortably. Such a situation is characteristic of a typical urban beach designed to attract a large number of users. These beaches often have an abundance of facilities and are characterised by the development and urbanisation of the immediate surroundings. In such cases, these adjacent areas serve as the main source of beach visitors.

Although S'Abanell in Blanes has the second highest number of users, in this case the mean sand availability per person is higher (8.15 m²/user). This is due to the large extension of the beach, making it possible to accommodate an increased number of users without obvious saturation problems. However, although this beach is not actually saturated, the minimum sand availability reached in a counting plot is again below the desirable limits (4.62 m²/user), indicating a high user concentration in some areas of the beach.

The mean sand availability for Malgrat Nord Beach is much higher and thus ensures a much more comfortable beach experience (34.20 m²/user). In the case of this beach, the low level of congestion is related to the high sand availability and to the fact that the beach is located a certain distance away from the town centre. Because of this distance, the vast majority of users on this beach come exclusively from the surrounding camping areas.

In Canyelles the mean sand availability is 12.57 m²/user, which can be considered an acceptable value. The mean sand availability of Santa Cristina – Treumal (11.33 m²/user), the best preserved beach in this study, is quite low for a beach of its characteristics, although it is between the desirable limits recommended for natural beaches (10–15 m²/user). However, because of its high environmental quality and the presence of fragile natural elements, the minimum value for sand availability registered in a counting plot, 4.36 m²/user, is considered totally inadequate for a beach of this nature.

4.2. Beach user profile

The purpose of this section is to briefly describe the beach user profile most frequently found in each study area. A typical beach user profile included information on origin, age and accompanying people. Some additional details were incorporated regarding

accommodation and transport tendencies in relation to the beach visit. Finally, the motives for beach choice were focused on so as to facilitate further interpretation of public perception. The results are presented in Table 4.

Malgrat Nord beach is a coastal environment visited by city dwellers. Almost half of the users (about 48%) were from Barcelona city and its surrounding built-up areas. The majority of visitors were staying in the campsites next to the beach. A significant number of users, however, had also come from the town itself (Malgrat) or from towns and villages located inland, due to good transport connections. Therefore, the user profile can be described as being mainly local, although foreigners of British, French, Dutch and Italian origin, most of whom were staying at the nearby campsites, accounted for almost 17%.

The beach is mainly used by families, with three quarters of the respondents enjoying a day out with the family or their partner. The vast majority of respondents claimed to use the beach for swimming and sunbathing, which divides the activities into passive and active leisure, and a significant group claimed to use the beach as a family meeting place and as an area to play with their children. The main motive for using this beach was its proximity to the campsites and the quietness of the area.

The user profile at the S'Abanell beach was mainly holiday-makers, more than half of whom used the beach every day. Over a quarter were European tourists (Dutch, English and French). Catalans represented the largest group: most of them had travelled from the Barcelona metropolitan area (24%) and to a lesser extent from the rest of Catalonia (21%) and the town itself (13%). The users stayed mainly in hotels and campsites (48%), or in second residences (28%), which were generally located just behind the beach.

Tourism that is predominantly family orientated: 74% of the respondents had come with a partner or the family and there was a strong prevalence of adults (53%). A high percentage (83%) travelled to the beach on foot. The main motive for beach choice was that their accommodation (35%) was in the vicinity. The accommodation was a house, hotel or campsite. Other motives included the landscape (23%) and family reasons (11%).

The main constraint at Santa Cristina Beach is that its accessibility is linked to private transport, which favours users from nearby areas, 16% of whom were locals, 32% had travelled from the Barcelona metropolitan area and 14% from the rest of Catalonia.

It is a family beach, with 73% of users accompanied by their partner or family. The majority had travelled to the beach on private

transport (80%), except for some tourists who were staying in the hotel located in the hinterland (17%) and had travelled on foot. Other tourists had arrived on a cruise ship (8%). The beauty of the landscape was the principal motive for beach choice.

Lloret undoubtedly attracts the most tourists. Thus, it is logical to find a large presence of foreigners (41%) and a minority of local visitors from Barcelona (13%) and the rest of Catalonia (6%). The respondents perceived the beach user profile as being of a diverse age range, although most users were young: over 69% were under 30 years of age. Only a few were accompanied by their families, while more than half had come with groups of friends. The beach is mainly accessed by foot. Parking areas are scarce and small, and only a small percentage of visitors used public transport (8%).

The tourists at this beach were accommodated primarily in hotels (60%) or in rented residences (11%). Although it was their first time stay in the village, these tourists visited the beach on a daily basis. In contrast, in the same municipality at Santa Cristina and Canyelles, the users were either local or from Barcelona and Catalonia and they claimed to visit repeatedly on an annual or seasonal basis.

The motives for choosing this central, urban beach differed in proportions compared to the other beaches. Proximity to the hotel was the main motive (29%), followed by an attraction for the landscape (22%) and the recreational facilities (16%).

Although it is possible to travel to Canyelles using public transport, more than three quarters of users had arrived by car from the town itself or neighbouring areas. The users mainly came from the Barcelona metropolitan area (40%); these were locals and foreign tourists accounting for nearly 20% each. The holidaymakers stayed predominantly in second residences (27%).

Canyelles is a family beach. This is confirmed by the fact that 73% of visitors had come with their partner or family. The landscape and the proximity of a second residence were the main reasons people gave for coming to this beach.

The majority of tourists in Tossa were families and 70% of the respondents were adults, unlike the user profile of Lloret, described above. The majority of users were Catalans and had travelled from Barcelona and Girona (77%). Foreign tourists from Western Europe represented a significant fifth of the total. Hotels were the most common accommodation type: 26% of users were staying in this type of establishment while 17% of users were staying in a second residence. An interesting statistic to highlight is that a quarter of the beach visitors chose this beach for day visits. Once again, the

Table 4
Beach user profiles for each study area. Values in percentages

	Ma	Bl	Ll	Sc	Ca	To		Ma	Bl	Ll	Sc	Ca	To
Origin							Accompanied by						
Locals	22	13	16	16	21	8	Alone	5	5	9	0	9	4
Barcelona Metropolitan area	48	27	13	32	40	31	With the family	57	42	14	45	46	34
Rest of Catalonia	13	21	6	14	17	29	With the couple	18	32	22	28	27	43
Rest of Spain	1	9	16	15	2	11	With friends	16	16	50	19	14	15
Foreign tourism	17	29	49	23	20	22	Others	4	5	5	8	5	4
Age							Transport						
Youth	34	39	69	45	25	26	On foot	50	83	70	10	21	39
Adults	61	53	28	51	69	70	Private transport	49	17	22	80	79	61
Elderly	5	7	3	4	6	4	Public transport	1	0	8	10	0	0
Accommodation							Motivation						
Habitual residence	17	7	10	13	14	7	Vicinity	40	35	29	14	30	14
2nd Residence	5	28	4	14	27	17	Tranquillity	21	4	0	7	12	10
Rented for the holiday	1	4	11	12	9	9	Family/friends	5	11	8	2	11	6
Home of friends/family	4	6	7	5	14	8	Landscape	6	23	22	38	34	38
Hotel/hostel/pension	1	32	60	17	3	26	Beach quality	4	3	0	8	2	6
Camping	68	16	1	2	13	6	Fidelity	1	9	0	2	7	15
Only spending the day	3	4	6	28	19	24	Accommodation facilities	17	5	4	1	0	1
Others	1	2	1	9	2	1	Recreational offer	0	1	16	1	0	0
							Others	6	9	22	26	4	10

Ma = Malgrat; Bl = S'abanell, Blanes; Ll = Lloret beach; Sc = Santa Cristina; Ca = Canyelles; To = Tossa.

quality of the landscape attracted the public to this beach. Visitors also claimed that they chose this beach over others on an annual basis.

4.3. Beach user perception

The following section presents the results obtained in the first part of the questionnaire, in which respondents were asked to give a score of between one and 10 to 50 parameters according to their degree of satisfaction. Five is an acceptable level. These parameters were divided into four categories to compare the beach qualities more effectively; this section will be divided into these four categories.

Fig. 2 clearly shows that physical and morphological aspects are the most highly rated by users for all the beaches, although users encountered difficulties when accessing and leaving the water due to the steep downward slope. Fig. 2 also illustrates how this problem is more pronounced in S'Abanell, Lloret, Malgrat and Tossa, all of which scored below five on physical and morphological aspects. This slope factor raises issues of safety, especially for elderly people and children, which were highlighted by some of the respondents.

Beach width was the parameter that incorporated the affect of climatic factors on several beaches. Again, S'Abanell and Lloret are open beaches that are relatively exposed to eastern winds, which are the most aggressive in the region. As a result of these stormy episodes, S'Abanell has been eroded and in Lloret the beach shoreline has fluctuated within the bay due to the alternance of the wave action from different directions [21].

Sand colour and texture significantly influenced public perception. The golden sand colour was very much appreciated in all the beaches in this region, which, combined with the intense blue of the sea and the pine trees, has become the internationally recognised image of the Costa Brava. However, in some cases, sand texture, which is identical in all the study areas, was criticised by some users.

The environmental aspects differed more between beaches than the previous category. Tossa de Mar scored the highest in beach cleanliness (6.9 on litter on the sand and 6.5 on litter in the water), despite its intensive use. This could be due not only to local management, but also to characteristics of the beach user profile, which is mainly families and adult groups that are more receptive

to environmental indicators. S'Abanell, Canyelles and Santa Cristina were rated between five and six for both categories. For cleanliness, both Lloret and Malgrat were rated below the acceptable value (five). However, the reasons for dissatisfaction regarding cleanliness differed. In the case of Lloret, the rubbish was created by the beach users themselves, while in Malgrat it came from the river. This is relevant for management applications in that, although it would represent a significant increase in cost, a much greater effort should be made by local managers to improve standards of cleanliness, particularly with regard to the sand.

The presence of vegetation is an indication of the level of nature conservation on each beach. In Canyelles and Santa Cristina, beach users were very pleased with vegetation cover, while in Malgrat, which also has rural characteristics, users were dissatisfied with the level of vegetation cover.

Facilities were perceived in very different ways. Although services are made available by the campsites, Malgrat Beach suffers from a lack of facilities and resources (see Fig. 2). The majority of users in this beach highlighted this and gave it a low score. The urban beaches of S'Abanell, Lloret and Tossa, where one might expect to find facilities such as restaurants, stalls, sports areas and rental options, scored well for facilities. Toilet and shower facilities are generally desirable in this kind of tourist beach, as has been observed in other studies. Thus, it was expected that well-equipped beaches would receive higher marks. Note that Fig. 2 illustrates that in the majority of the cases toilet facilities did not satisfy visitor requirements. There are two main reasons for this. The first one is simply due to the lack of services, which is demonstrated in Canyelles and Malgrat (3.5 and 3, respectively). The second reason is that on some beaches, the toilet facilities either go unnoticed, or there are too few in relation to the high number of visitors.

User perceptions of parking areas varied among the study areas. To park a car in the overcrowded or urban areas is difficult. At times this is made even more difficult when the parking lots are particularly small, or indeed impossible if there are no such facilities, which is the case for the urban beaches of S'Abanell, Lloret and Tossa. However, the visitors here were staying in the hotels within the beach villages, meaning that the beaches could be accessed by foot. This was noted by the respondents. In contrast, parking at Canyelles scored an incredibly low mark simply because the lack of parking facilities is particularly problematic during the peak season.

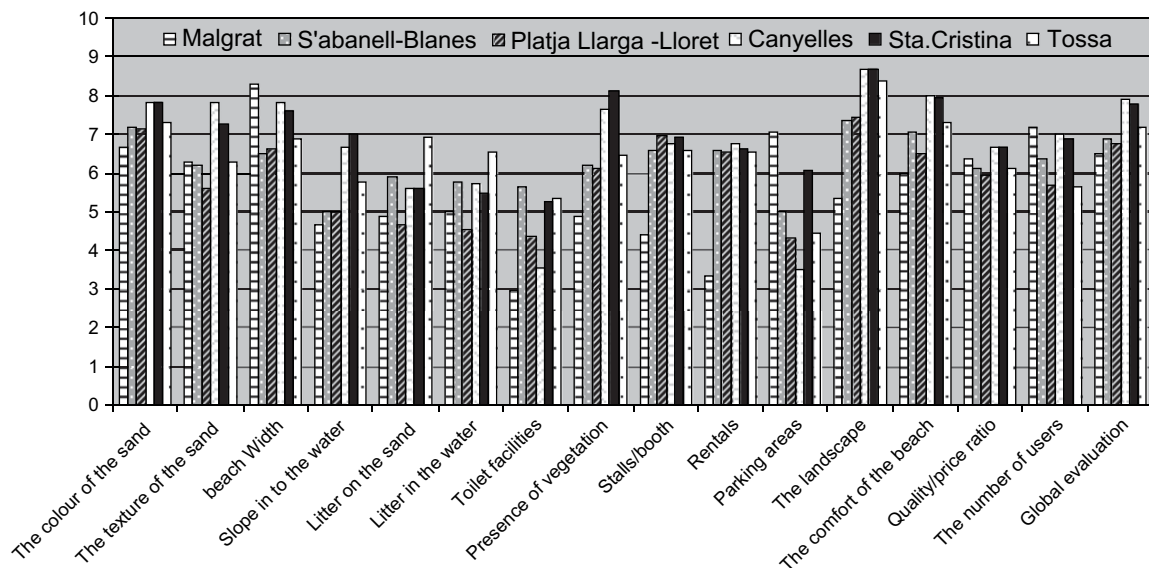


Fig. 2. Beach user evaluation of beach quality parameters.

Finally, parking at Santa Cristina and Malgrat satisfied visitor requirements in a very different degree. In Santa Cristina, parking is private, resulting in a high toll for car drivers, whereas in Malgrat, which is in the middle of a rural area, parking causes no problems and consequently scored very highly.

The category for landscape, comfort and overall evaluation was considered the most subjective category as it was difficult to ascertain a quantitative reference for comparison. Landscape evaluation scored the best mark in all the study areas with the exception of Malgrat. In all these beaches, scenic beauty was one of the main motives for visitors coming to the beach, whereas in Malgrat tranquillity was rated over landscape. It is worth mentioning that Malgrat is an exception to the typical image of the Costa Brava branded by golden sands, by pine-forested cliffs and pocket beaches. Above all, Canyelles, Santa Cristina and Tossa are the most representative of the touristic image of the Costa Brava.

With regards to the number of users, Canyelles, Santa Cristina and Malgrat were rated the best, with the most comfortable ratio of user/sand availability. In contrast, Lloret and especially Tossa, were penalised the most for being overcrowded. The quality/price ratio was relatively even for all the beaches. However, Canyelles and Santa Cristina scored slightly higher, which might be attributed to the high cost of the parking areas which almost any user arriving by car has to pay. Comfort and overall evaluation could be considered a synthesis of the rest of the categories: the results for this category follow the same pattern as the others. Again, Canyelles, Santa Cristina and Tossa scored slightly higher than the other study areas.

4.4. Interactions between beach attendance and public perception

To analyse the effect of beach congestion on the satisfaction of beach users in further detail, mean sand availability on each beach was related to the mean score for user satisfaction based on user density (Fig. 3. $R^2 = 0.555$; however, $p > 0.05$, which is probably related to the low number of cases considered in this regression).

A higher sand availability increased user satisfaction, although not as much as might have been expected because other parameters are also highly relevant in evaluating beach quality from the perspective of beach users. A clear example of this fact is that although the beaches with the lowest sand availability, Lloret de Mar and Tossa, were the most penalised in comparative terms, they were repeatedly rated above five for user satisfaction, which is indicative that saturation is not a definitive inconvenience for the users. In such cases, the space occupied by services might increase the perception of saturation. In Tossa there are various conflicts regarding space availability, e.g., cruise ships regularly disembark

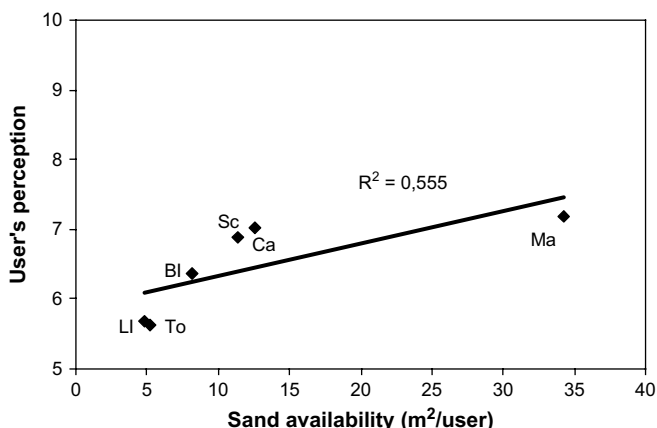


Fig. 3. Correlation between sand availability and beach user satisfaction based on user density.

on the beach and beached boats are commonly seen. This mass of activity contributes to the sensation of overcrowding. Another aspect linked to the sensation of overcrowding is the noise, which can be of human origin or from other sources, such as car or boat engines. Lloret and Tossa, which are the busiest beaches, were rated the lowest in this category.

However, there is only a difference of 1.5 between the scores for these beaches and that of Malgrat de Mar, which has the highest sand availability. This is remarkable considering that sand availability is seven times higher in Malgrat de Mar. It is possible that on such a busy urban beach, the crowded scenario is so common that visitors accept it as normal and are therefore not discouraged by it.

Because of the very well-preserved nature of Santa Cristina – Treumal and Canyelles, we expected a very demanding user profile, especially on Santa Cristina – Treumal, as well as negative feedback regarding congestion levels, which we considered too high for a beach of this type. Again, this can be attributed to the fact that users have become used to these situations and are not discouraged by them.

The crossing of beach occupancy data and user perception shows that contrary to what might have been expected, high levels of occupancy do not necessarily imply low levels of satisfaction. Other parameters (e.g., physical characteristics, landscape, facilities) are also important in evaluating beach quality from the perspective of beach users.

5. Conclusions

In this paper, we have combined two approaches in order to integrate a social dimension into the evaluation of beach quality in eminently tourist destinations. The first approach, the occupancy analysis, illustrated that urban beaches, which are highly accessible, suffer the most from overcrowding and that the adjacent urban areas are the main sources of visitors. Although they are less accessible, semi-natural beaches also attract a high number of visitors because of the landscape and natural qualities. The second approach, which surveyed user perception of social factors regarding beach quality, illustrated that a beach quality evaluation is best achieved using different parameters and not simply by concentrating on beach user density.

This study has illustrated that although beach occupancy and public perception are correlated, the overall enjoyment of the beach experience for visitors in these study areas is not diminished by aspects strictly related to the number of users. This partly confirms that the “sun, sand and sea” tourism model is still valid and that there is still a demand to meet the requirements of tourists in the typical beach holiday scenario. Finally, in terms of management, these conclusions indicate that aspects other than beach occupancy should be considered to effectively evaluate, and thus improve, the quality of beach users’ experience.

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