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Public perceptions for evaluating beach quality in urban and semi-natural environments

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Abstract

The lack of bottom-up approaches to assess beach quality and to adapt it to local context is addressed in this paper. Our aim is to explore the public perceptions and preferences according to the degree of exploitation/conservation of the beaches to draw policy recommendations. The methods, which have been applied on 6 beaches along the coast of North-eastern Spain (Costa Brava), involved a survey of 700 beach users, an extensive checklist to register the objective reference and a set of in-depth interviews to local stakeholders.

The preferences and perceptions appear to be not only influenced by the specific characteristics of each beach but also by the beach-user profile. Policy implications points out that conservation strategies should be prioritised in natural environments, while interventionist approaches enhancing recreational beach functions should be orientated to intensive used beaches, normally located along urban seafronts.

1. Introduction

Beaches are multidimensional systems where human and biophysical subsystems are in a continuous, dynamic and complex relationship. According to Constanza et al. [1], such ecological systems supply different services for the benefit of the society like erosion and flood protection, biological control and provision of recreational and cultural values. However, the coexistence of all these services can be conflictive and complex to manage, especially in the tourist areas where the anthropogenic pressure is very high.

The Mediterranean shoreline is a prime example of this situation, where although some traditional activities remain, tourism is the largest sector of the economy in many coastal zones. Western Mediterranean countries (Spain,

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France and Italy) receive around 175 millions of visitors per year [2] who mostly select the beaches as their main motivation. As a consequence of this, Mediterranean beaches have been converted into motors for local economy providing a significant part of the economic income. As an example, the tourism contribution to the GNP in Catalonia was about 10% in 2001 and about 65% of the foreign tourists choose to stay in coastal areas. However, this monoculture tourism is ''eroding'' the capacity of the beaches to provide natural services which reciprocally has a detrimental effect on tourist activities. Therefore, not only the quality of natural resources has been affected but also tourism has become more demanding with its recreational experience.

In fine, tourism has been identified as one of the main factors affecting the quality of the coastal environment which in many cases result in coastal degradation (see e.g. Smith [3] and Wong [4]). On trying to deal with this situation, a set of instruments have been developed to evaluate beach quality in order to manage both environmental degradation and recreational uses. In Europe, the first sign of this concern came in the mid 1970s with the EC Bathing Water Directive [5] basically referring to water quality criteria. Afterwards, in 1987 the most prestigious and wide-known quality award scheme, the European Blue Flag was introduced. This award qualifies a beach on the basis of 26 pre-established indicators covering aspects of, water quality, environmental management, safety and services, environmental education and information.

This sort of beach award schemes have gained many critics due to the fact that they do not consider the beach itself and apply the same quality standards for different types of beaches [6]. Nelson and Botterill [7] criticises that they are aimed at resort beaches, intensively managed to support tourism. In addition, Duck et al. [8] argues that such specific tourist orientation focus on human parameters (e.g. provision of facilities) affects negatively on scenic values. Finally, James [9] adds that beach management has been traditionally orientated to the protection of geomorphologic hazards and to providing recreation, leaving ecological functions in second place. Thus, there is a lack of recognition of beach type diversity within this sort of schemes.

Another traditional problem has been that many of these management tools were single perspective-based, focussing only on water quality or safety or health-related aspects [10]. In that respect, current norms used such as the ISO standards or different national awards are becoming wider in their scope since they include other criteria and are more oriented towards the quality of the process rather than in the final product itself [11].

However, they are disapproved due to their top-down approach [12] and due to the fact that little or no importance is given to the evaluation from the user's point of view. In spite of the fact that recreational uses are prioritised in many cases, patterns in beach user's behaviours and addressing their attitudes and perceptions are missing. The need for considering beach user's preferences, opinions, concerns, demand is acknowledged by several authors (Morgan et al. [13], Morgan [14], Williams et al. [6], Breton et al. [15], Villares [16], Villares et al. [17], Nelson et al. [12], Priskin, [18]).

Up to now, although a number of authors have considered the value of quality indicators for beaches, only a few studies have been carried out in the field of social perception applied to beach planning and management (Cutter et al. [19], Morgan et al. [20], Williams et al. [6], Breton et al. [15], Leatherman [21], Villares [16], Villares et al. [17], Pereira et al. [22]).

In order to overcome the drawbacks of this kind of management tool, such as the lack of a more bottom-up approach and the need for considering the diversity of beach environments (ranging from strictly natural to recreational environments) innovative and more effective methods are required. Seeking a better understanding of how individuals perceive beach quality is very relevant for beach managers to engage a particular strategy towards integrated coastal management. Consequently, comprehensive information of user expectations and demands should be added to the assessment enhancing a better-informed process.

The main goal of this paper is to analyse public perception and preferences of different aspects of beach quality to draw policy recommendations. Public perceptions can be influenced by beach specific characteristics and by individual profiles. In order to assess perceptions, two different beach types have been analysed: (i) intensively used/urban and (ii) semi-natural beaches. For each beach type, the user profile is described together with their perceptions and preferences on several groups of aspects that are obtained through a detailed structured questionnaire.

The work has been conducted in the Costa Brava, a highly developed tourist area in the NE Spanish Mediterranean coast. Due to the climatic, geomorphologic and socio-economic characteristics of the area, the approach and results can be extended and/or adapted to other Mediterranean areas and to zones with important coastal resorts. Thus, it is an illustrative case of the sun and sand sprawl model experienced during the 1960s and 1970s in many tourist destinations of the Mediterranean basin.

2. The study area

The area studied is in the south of the Costa Brava, located in the NE of Spain 100 km to the north of Barcelona city. Beaches selected belong to 4 towns which are Malgrat, Blanes, Lloret de Mar and Tossa de Mar. These 4 coastal towns rely almost exclusively on the tourism and property sectors (see Fig. 1). In addition to an important hotel trade, these towns have a high proportion of holiday homes, a fact which adds a large number of national holiday and weekend residents to tourist numbers. Moreover, the difference in numbers between year-round and temporary residents is considerable.

Beaches on the Mediterranean basin which are major tourist resources and attractions are the main source of economic income in many places. They have played a key role in the regional and social development of the area in recent decades. Our case study is a good example of this process.

Regional development along the Costa Brava took off in a spectacular way in the 1950s, when the sun-sea-and-sand model of tourism started to take hold. Tourism also had an important spin-off effect on other economic sectors, such as the hotel and restaurant trades and the construction industry, which in turn attracted labour inflows from the rest of Catalonia and Spain.

These developments ushered in a period of radical transformation that culminated in an almost exclusive dependence on tourism in some municipalities in the region. A number of problems gradually arose, however. In some areas, practically all traces of nature have by now been obliterated from the coast and the coastal landscape has been substantially damaged [23]; the only place, in fact, where nature has remained almost intact are a handful of protected sites and areas where urbanization would have proven difficult in any case.

Malgrat, a municipality located in the southern limit of this region, has 17,500 static inhabitants rising to 50,000 residents in the peak season [24]. Our interests are focussed on the northern beach, which is less exploited maintaining a certain natural setting, with few services and hardly any facilities which are replaced by the close presence of campsites. Morphologically, it is an open and extensive beach which is widely exposed to the wind. It ends at the Tordera River's mouth where its natural appearance and attraction is maximised.

Blanes, the second municipality, rises from 37,800 to 100,000 inhabitants in the tourist season [24]. Its shoreline ranges from creeks in natural environments to central urban beaches completely developed and oriented to recreational uses. The survey was carried out on a sandy beach belonging to the latter group.

Lloret de Mar is a municipality that experiences even more spectacular growth in the summer season, with a population that rises from 32,700 to 200,000 [24]. Its shoreline is highly diverse and we selected three beaches for our surveys: a central and very urban beach called Platja Llarga, with two pocket beaches – Sta. Cristina and Canyelles – located in less urbanized environments far away from the city centre.

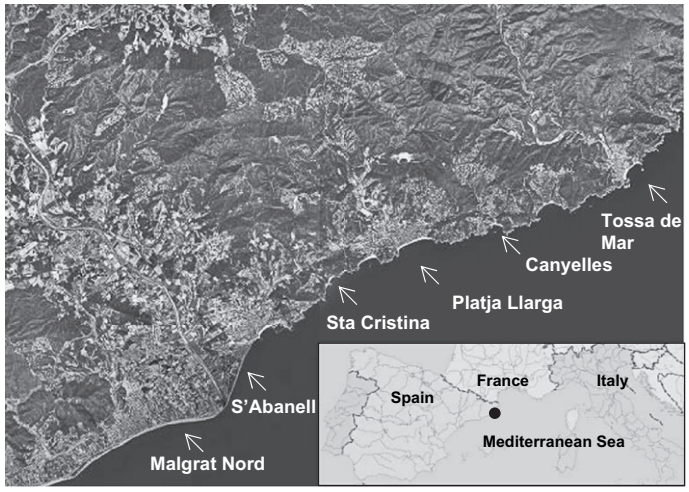

Fig. 1. Location of study beaches. Source: Catalan Institute of Cartography.

Finally, Tossa de Mar is the smallest municipality with a population rising from a static, permanent population of 5400 inhabitants year-round to a 50,000 floating population in summer [24]. Its two central beaches are not very extensive.

The study area has a wide diversity of beaches in regard to the level of exploitation and its natural conservation, which point out two extremes depending on the predominating ecosystem function (natural vs. recreational). Other authors have previously defined these situations and named them in different ways. For instance, Micallef and Williams [10] classifies beaches as resort/non resort beaches, Nelson et al. [12] talks about undeveloped and commercialised beaches. Although in our cases studies on a completely natural beach is not found, for analytical purposes, we distinguish between two categories of beaches:

a. Urban:

These beaches are found in front of dense urban areas with a variety of commercial services and tourist accommodation. They are normally surrounded by a rigid boulevard or a road. Being extensively developed with an intensive provision of facilities and services, the recreational value far exceeds that of conservation.

b. Semi-natural:

This type of beach has a disperse urbanized area behind. They present reduced accessibility, only by private transport and this implies less frequent visits and reasonably preserved natural values. They provide a limited number of facilities for users.

Fig. 2 shows the main characteristics of the beaches studied including facilities and services provided to the users.

3. Methodology

The methodology designed implies two complementary approaches – quantitative and qualitative – which have been previously tested in Villares et al. [16, 17]. The idea of linking different qualitative and quantitative methods are widely discussed in Flick [25] and on our understanding it is becoming essential to deal with environmental issues. It aims at overcoming the limitations of a single technique by combining several methods and giving them equal relevance.

The first method consists in a massive survey of beach users' profile and perception by means of a questionnaire. Simultaneously, this was accompanied by the recording of beach characteristics during the survey to define the ''objective beach''. The second method was an in-depth semi-structured interview to main stakeholders. This technique is widely used in social sciences to clarify and deal in depth those aspects that cannot be easily understood with just a quantitative survey.

3.1. Beach users' survey

The questionnaire included the following parts:

Part A. Beach users' profile.

This part incorporated variables on socio-economic and demographic profiles (age, sex, profession, place of residence), their habits using that particular beach (means of transport, length of stay, companions and types of activities undertaken on the beach) and information on their accommodation and frequency of their visits.

B. Beach quality evaluation.

A set of 46 parameters were evaluated by beach users. They had to give a mark from 1 to 10 to each item depending on the level of satisfaction they provided. The set of parameters were split into 4 categories: physical and morphological aspects, environmental aspects, aspects related to equipment and services and, finally, design and comfort.

C. Preferences, motivations and suggestions.

In order not to lead respondents and to allow some degree of flexibility, two open-ended questions were included aiming at ascertaining (i) what are beach users' main reasons for selecting that specific beach; (ii) what propositions beach users have to improve the beach and its environment. In addition a closed question focused on the importance

Beach/ Municipality **Type of beach** **Size** **Facilities**	**View of the beach**
Malgrat Nord/Malgrat Semi-natural 2,270m/ 50m Non-equipped	
S'abanell/ Blanes Urban 3,100m/60m Full-equipped	
Sta. Cristina/Lloret Semi-natural 365m/30 Semi-equipped	
Platja Llarga/ Lloret de Mar Urban 1,300 m/40m Full-equipped	
Canyelles/ Lloret de mar Semi-natural 400m/40m Semi-equipped	
Platja gran/ Tossa de Mar Urban 385m/50m Full-equipped	

Fig. 2. Description and classification of study beaches. Source: Ministry of Environment.

beach users give to each set of items (good facilities, comfort and safety for bathing and swimming, clean water and sand, good access and parking areas, attractive views and landscapes and peacefulness) when they choose a beach.

In order to estimate the sample as representatively as possible, we based our calculation on the maximum data related to visits in the high season. Unfortunately, there are few surveys related to visits in the area: the works of

Alemany [26] and Breton et al. [15] arrived to similar conclusions. According to Alemany [26] our six beaches have a total peak visitation of 25,790 users. Subsequently, we decided to display 100 questionnaires per beach which sums 700 in total, which is a wide sample, representative of the total population.

The fact that the study area was frequented by a large number of seasonal tourism was a relevant issue to consider because this implied that the beach users speak different languages. In order to guarantee the proportion of the different types of tourism in the sample and to avoid interviewer biases when selecting respondents, it was decided to stratify the sample according to the presence of each nationality. This information was taken from the local tourist office. Thus, the questionnaire was designed in 4 languages (Catalan, Spanish, English and French) and the fraction of each language was in coherence with composition of nationalities, taking into account that German and Dutch users could answer them in English and Italian could deal with the Spanish ones.

The sample used was a random group of people on each beach in a weekend of the peak season. Respondents were at least 16 years old. In total, 700 questionnaires were displayed over the last weekends of July during the bathing seasons in 2004 and 2005. The method of random sampling was based on a set itinerary which the interviewer followed in a zig-zag fashion, trying to cover the whole beach.

Respondents were approached courteously and the purpose of the survey explained to them, together with the affiliation of the surveyors. They were then asked if they would wish to complete the survey form. Each questionnaire took about 20 min to be completed. Simultaneously a total of 6 checklists were filled in to provide the objective reference.

For the data analysis the answers obtained through the questionnaire were introduced in a SPSS v. 12 statistic software. First the questionnaire was analysed with a descriptive analysis: mean and standard deviation for each parameter valuation grouped by beach type (urban and semi-natural). For comparative purposes, the arithmetic mean was calculated for each item to contrast perceptions. An analysis of the number of visits was done for data on beach user's profile.

It was expected that responses would differ between beach types. In order to test associations in the users' preferences and items perceptions the results were statistically treated with the Mann–Whitney U test, a non-parametric test for non-related samples. Furthermore, in the case of users' preferences, the differences between items in the same sample was considered important, as the aim of the question was to establish a prioritization in users' choice, so that the Wilcoxon signed-rank test was also applied. Results were considered significant at $P < 0.05$.

3.2. Stakeholders' survey

A quantitative technique as described above, has to be complemented with qualitative information in order to acquire more in-depth information about answers given by beach users and to obtain a detailed and sectoral insight. Here it was decided to apply a motivation analysis which is a method of interviewing selected representatives, who provide the opinion of their organisations. The in-depth interview was designed and oriented to local stakeholders who had experience and knowledge of the beaches under study and who could provide technical details and also more strategic information. This type of methodology allows us to investigate and understand the reasons for certain perceptions. However, the results have to be treated carefully as interviewees are influenced by their personal situation and ideology.

More than 40 in-depth interviews were carried out in the spring of 2004 and 2005 to local stakeholders who were concerned with coastal issues, ranging from local authorities, ecologist associations, tourism, to those who were directly involved in the beach management like people who clean them, rent sun-chairs or manage bars, lifeguards, police, Red Cross officers, etc.

A content analysis of the in-depth interviews was performed to fully understand questionnaire results. Qualitative information plays an illustrative, explanatory part in the process of presenting and interpreting the results. Some statements extracted from the interviews are exposed in the results sections to contrast means and frequencies found in the questionnaire.

4. Results

4.1. Beach user profile

This section aims to briefly describe the beach user profile most frequently found in each type of beach regarding their origin, age and accompanying people. In addition some details about their habits on accommodation and

transport used to reach the beach are offered. Finally, establishing the range of motivations for choosing each beach is highlighted in order to facilitate further interpretation of public perception.

As Table1 shows, in general, beaches of the Costa Brava attract more visitors than local residents (which are here defined as from the same municipality or neighbouring areas). The main groups are the city dwellers from Barcelona metropolitan area (BMA), followed by foreign tourists. Analysing separately by beach types, the semi-natural beaches are more frequented by visitors from BMA in 40% which altogether with locals and Catalans comes to 75% whereas in urban beaches this percentage decreases to 55%. The difference is accounted for by foreign tourism in the urban environments which rise to more than 30% in urban that becomes the larger group.

Regarding accommodation, the biggest group is hosted in temporary residences like hotel/pension/hostel or camping. Locals are present not only in the habitual and residence category but also in ''only spending the day'' in the case of 1 day excursions to a neighbouring beach. Users of urban beaches frequently stay in tourist facilities such as hotels, apartments or pensions in 40% which is partly linked with foreign tourism. The higher percentage of camping users, more than a quarter in semi-natural, is understandable if we take into account that most of these beaches in the study area usually have camp-sites in the hinterland.

Foreign tourists mostly arrive at the region by a tour-operator, which brings them directly from home to hotel. This makes it difficult for this segment to reach the semi-natural beaches on their own as public transport is almost non-existent. The only opportunity is by cruise. Beaches with more natural settings, those categorised as semi-natural, are primarily accessed by private transport in 64% of the cases facilitating the arrival of mainly locals and Catalans. On the other hand, the proximity of accommodation to the urban beaches together with the fact that parking areas are not nearly sufficient explains the high percentage, up to 64%, of beach-users who reach the three urban beaches on foot. As a stakeholder pointed out: ''This is a completely tourist beach (..) as there is no parking areas or they are always full, the tourists who stay in hotels reach the beach on foot''. While in semi-naturals only a quarter gets to the beach on foot which may correspond to the residents from the closer hinterland. These results on accessibility concur with other work conducted on English beaches by Tunstall and Penning-Rowsell [27].

Beach recreational experience is a social occasion. As can be observed in Table 1, groups (families, couples or groups of friends) are more frequent although solitary visits can also be found. In semi-natural beaches, which are more peaceful, family tourism is more common while urban beaches concentrate large groups of youths as a result of a ''night-party tourism'' developed in some municipalities such us Lloret.

Finally, it is worth noting the motivation for choosing a particular beach. An important group of answers in both beach types, which is the vicinity – 21% for urban and 29% in semi-natural – is due to the fact that the majority of users stay in the tourist infrastructures in the hinterland, mainly holiday homes, hotels or camp-sites. However, people do not go to a certain beach just because it is close, the data clarifies and provides more insights into knowing why people have arrived at a particular municipality. As can be observed from Table 1, scenery plays a key role. We must remember that the study beaches are on the Costa Brava where natural resources (scenery and beaches) make up an important part of the presented to tourism and the marketing strategy pursued by the local community is mainly based on the beautiful landscapes, clean waters, gastronomy and cultural events. Therefore, a priori, urban landscape would be expected to have a lower value but they receive the same percentage as semi-natural. However, some seafronts are perceived aesthetically attractive as is the case of Tossa ancient village. In addition, Tunstall and Penning-Rowsell [27] suggests that even in the highly developed beaches the seemingly natural appearance of coastal landscape is highly appreciated and significant in guiding people's choice, which also includes the town behind the beach and the surroundings. The high percentage of questions unanswered is methodologically normal as the results come from an open-ended question.

A significant difference in motivations is found in the peacefulness and the beach quality which motivated 12% and 4% of beach users' for choosing semi-natural beaches, showing that these beaches do not receive massive amounts of people and are precisely valued for that reason. On the other hand, urban beaches receive a significant 5% of people who look for recreational activities.

In relation to the impact of beach users' behaviour on the local economy, it has been observed through the in-depth interviews that the Catalan tourist with a holiday home or with a temporary stay also seeks for other cultural interests (gastronomy, local festivals, historical heritage, etc.) and spend more money in the municipality. This is in contrast to the huge amount of foreign tourists that get to the site through tour-operators. ''They go from the hotel to the beach and from the beach to the hotel, afterwards they head to the disco and come back to the hotel...'' as a local authority explained. This represents a lesser economic impact. Another aspect pointed out in Breton et al. [15] was that

Table 1
User profiles in each beach type

Variable	Urban (%)	Semi-natural (%)
Age		
Youth (<30 years)	45	35
Adults (31–69) years	50	60
Elderly (>60 years)	5	5
Habitual place of residence		
Locals	12	20
Barcelona metropolitan area	24	40
Rest of Catalonia	19	15
Rest of Spain	12	6
Foreign tourism	33	20
Motivation		
Vicinity	21	29
Tranquillity	4	12
Family/friends	7	5
Landscape	22	23
Beach quality	2	4
Fidelity	7	3
Prices	3	0
Recreational offer	5	0
Others	11	10
Don't answer	18	13
Transport		
On foot	64	26
By car	31	64
By urban bus	2	1
By cruise/boat	0	3
By bicycle	0	1
By train	0	0
Others	2	5
Accompanying people		
Alone	6	5
With the family	30	49
With the couple	32	24
With friends	27	16
Others	5	6
Accommodation		
Habitual residence	8	15
Holiday home	16	15
Rented for the holiday	8	7
Home of friends/family	7	8
Hotel/hostel/pension	40	7
Camping	8	27
Only spending the day	11	17
Others	1	4

some all-day users will eat in the bar or restaurants nearby, but most of them bring their own picnic implying a low impact in local economies. This explains the efforts of the local communities to attract "a better quality tourism" represented by those segments prepared to pay more. In that respect, the business community, consisting mainly of hotels, restaurants, shop and beach-based business owners, acknowledge the need, on the one hand, to actively offer complementary cultural, sporting and entertainment activities that would reduce the high degree of seasonality attached to this kind of tourism. On the other hand, efforts should be made to improve the level of services and facilities provided not only on the beach but also in the surrounding areas.

To sum up, the beaches studied correspond to a typical tourist environment much more frequented by visitors than by local residents, mostly motivated by their landscapes even when they are urban. In the case of urban beaches the predominant profile is foreign tourism, groups of youths or accompanied by their families. They reach the beach mainly on foot as they are primarily hosted in temporary residences in the nearby hinterland. The semi-natural beaches are more frequented by locals or Catalan holiday-residents seeking for tranquillity and high quality beaches. The fact that beaches are linked to private transport dissuades foreigners to come.

4.2. General preferences for choosing a beach

As previous studies have shown people consider a variety of factors when choosing a beach, but some parameters are more important than others (Morgan [14], Tudor and Williams [28]). This is illustrated in Fig. 3 that presents the results obtained from the generic question asking about the importance beach users give to each set of aspects. From this figure, it can be observed that the resultant ranking is apparently very similar in both types of beaches. Nevertheless, some differences should be highlighted since the application of the Wilcoxon signed-rank test aiming at comparing statistically differences between items in the same group. The resultant rankings are:

For urban beaches:

Clean water and sand > comfort = attractive views and landscapes > tranquillity = good accessibility = good facilities.

For semi-natural beaches:

Clean water and sand > comfort = attractive views and landscapes = tranquillity > good accessibility > good facilities.

It is interesting to observe a common trend where cleanliness and hygienic conditions are the most desirable aspect when respondents select a beach since the item clean water and sand scored above 9 in both groups. This is also comparable with the work of the Metropolitan Beaches of Barcelona, where the main factors prioritised by beach-users were those related to health and safety [15]. Furthermore, it also concurs with similar studies conducted along Anglo-Saxon beaches [28, 20] where clean litter-free sand and clean water are the most important criteria, followed by safety. However, this slightly differs from Nelson et al.'s work [12] who found that in 44 Welsh beaches by far, the highest priority was given to scenery followed by beach safety and water quality. This may be explained by

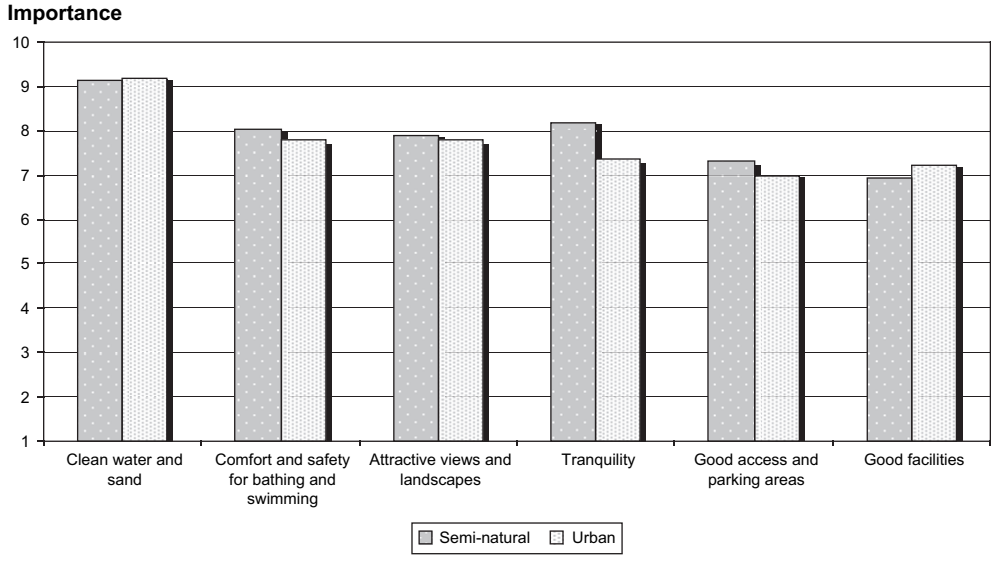

Fig. 3. Importance given to each group of aspects on a 1–10 scale (10 = very important).

the fact that in Wales meteorological conditions do not favour bathing uses as in the Mediterranean Sea, so beach users of the former are not in so close contact with sand and water as the latter. Therefore, Welsh beach user's are more sensitive to aesthetical features rather than those concerning sand and water quality. What concurs with Nelson's work is the fact that facilities are given the lowest priority.

It should be noted that the mean values among some items were not statistically different. This is the case of attractive views and landscapes, comfort and safety for bathing and swimming, which scored equally high. These aspects along with peacefulness are slightly more appreciated in semi-natural beaches, whereas in urban beaches peacefulness is not as important as in the former. Even though, one has to keep in mind that beach users, when they are lying on the sand, are spending leisure time looking for calmness and relaxing sensations, even in an overcrowded beach, which explains the 7.3 mark in "tranquillity". Good access and parking areas and good facilities are placed in the last position, which has been also found by Tudor and Williams [28].

4.3. Public perceptions

This section presents the results obtained in the second part of the questionnaire where respondents were asked to value a set of items, from 1 (minimum satisfaction) to 10 (maximum satisfaction) with 5 as the acceptable level. We have divided these items into 4 general groups of aspects (physical and morphological, environmental, facilities and services and, image and comfort) and compared between the urban and semi-natural beach types.

In general, respondents are satisfied with physical and morphological features in both types of beaches and no item scores below the level of acceptance (Fig. 4). However, physical variables and configuration are more satisfactory for those going to semi-natural beaches, which normally are less developed so users find the naturalness they are looking for in these kinds of environment. They highly value the spaciousness of these beaches. The width and the length of sand extension are configurative elements which scored substantially higher than other factors. These features please users as they search for values like peacefulness, freedom and distance from strictly urban and developed sites.

Furthermore, from Fig. 4 it can be observed that satisfaction with beach dimensions is statistically significantly different between both beach types. The lowest scores are found in urban beaches, which may indicate the sensation of a lack of space. In our case this perception is due to two reasons. On the one hand the overexploitation of the sandy area (rentals, boats placed on the sand, stalls, etc.) and on the other, some erosion problems in very central beaches (e.g. S'Abanell and Lloret) result in a reduction in sand surface which does not favour the peaceful coexistence of multiple uses and increases the feeling of overcrowding (see e.g. Valdemoro and Jiménez [29]).

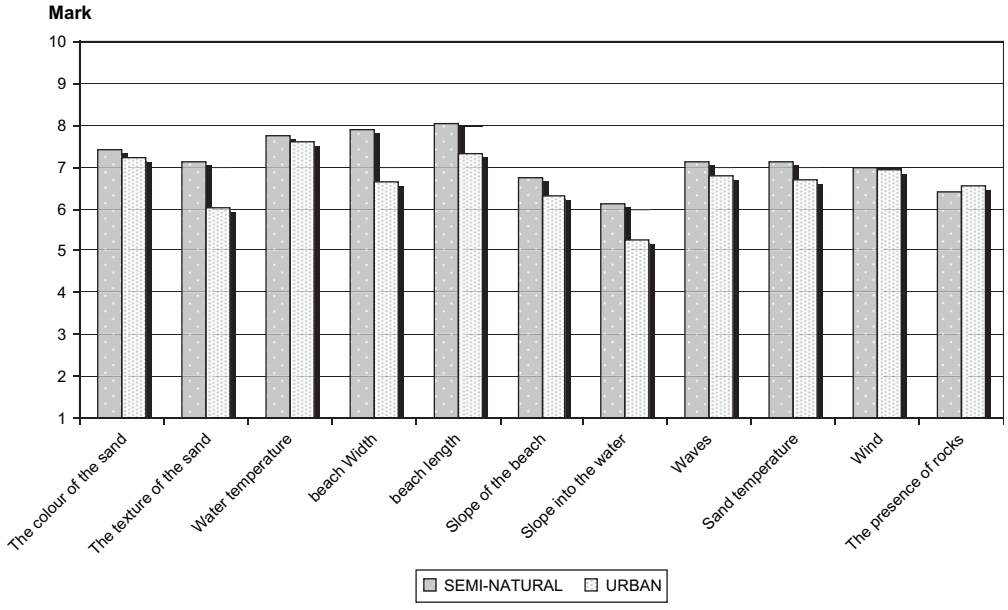

Fig. 4. Physical and morphological aspects.

The slope into the sea, a factor linked with safety for swimming, has different perceptions for both beach types, but both were scored low, especially in urban environments where this item has received the lowest mark of the whole group. In these beaches, users desire a gentle morphology in coherence and adapted to the massive public use of this kind of beach. Whereas in more natural environments, the slope is not so penalised by users because they go there to experience nature more than to have a comfortable recreational experience.

Sand characteristics (colour and texture) are important items that influence to a large extent the perception of the beach users. On the one hand, in the study area, its colour is very much appreciated for all the beaches. The golden colour is very typical of this region, which in contrast with the sea has become the international tourist image of the Costa Brava. Therefore this is what the tourist comes to find. On the other hand, the sand texture provokes some controversy depending on the type of beach although it is the same size, medium thickness, in the whole study area. Considering the fact that the kind of sand texture is similar everywhere, the difference in the score average may be due to the differences in the beach user profile. In urban beaches, the discomfort linked to big grain size makes this item score low which corresponds to the higher presence of foreign tourists without previous knowledge about the local physical conditions. Their search for the stereotype of a comfortable, ''easy'' and safe beach is broken here. On the contrary, locals and holiday-residents appreciate this sand because it is an element that is a particular property of these beaches differentiating them from other beaches on the Mediterranean coast of Spain. This interpretation was also suggested in the in-depth interviews. Locals expressed that ''this sand is good because it doesn't stick to your skin and when the wind blows the sand stays'' In contrast, the Tourism Council mentioned that ''tourists dislike this kind of sand as it hurts their feet'' and a foreign beach user claimed that ''my children can't make sandcastles with this sand''.

Fig. 5 shows the results obtained for the environmental aspects for each type of beach. In general, this group is the less valued by beach users and differences are quite slight. Statistically significant divergences are observed in the cleanliness items which may have two parallel explanations. On the one hand, beach users from semi-natural beaches are more sensitive to litter so that they express their demands by giving a low mark to those items. On the other hand, substantial cleaning efforts carried out by local authorities in urban environments are appreciated by their users.

In contrast, the users of more natural beaches show a high satisfaction for those aspects related to natural environmental quality such as the presence of vegetation or aquatic biodiversity. Furthermore, as it would be expected, the noise from people is perceived stronger in urban beaches due to the huge agglomerations and the conditions of saturation in the peak season. In spite of that, the score is above the limit of acceptance with 5.9. Users may expect overcrowding and that is why they might not feel completely dissatisfied.

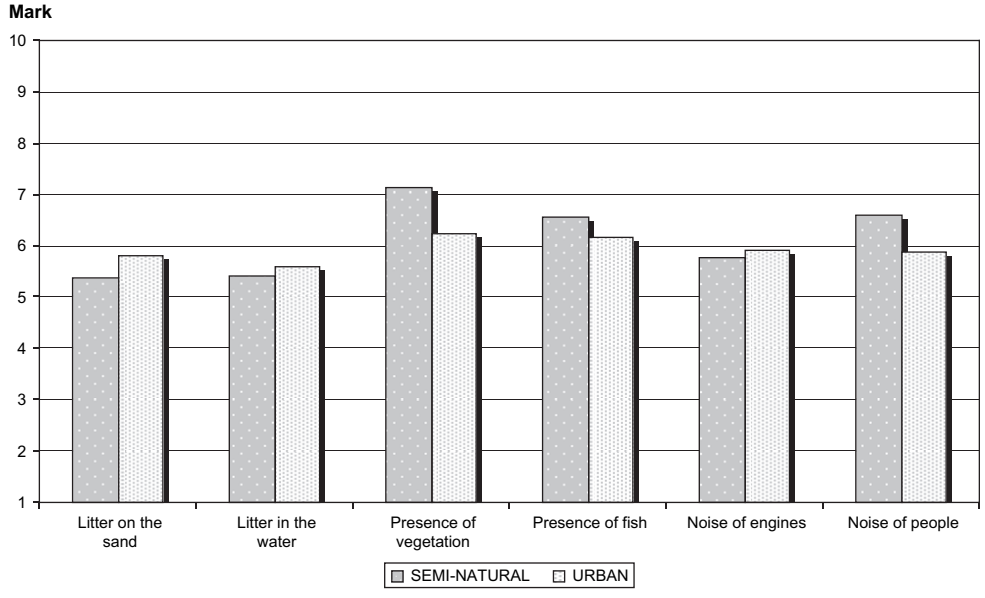

Fig. 5. Environmental aspects.

On the whole, environmental aspects represent the most penalised group in this questionnaire, whatever beach is evaluated. This demonstrates the high sensitivity of beach users for this kind of feature which concurs with the importance given to sand and sea cleanliness as explained in the previous section.

In Fig. 6, results obtained in the facilities and services items are represented. Even though differences are not so notable, urban and developed beaches have more positive perceptions in some aspects such as in the provision and maintenance of sanitary services (toilets, showers, litter-bins). The greatest difference, up to 1 point, is found in the toilet installations, which do not exist in semi-natural beaches and was the lowest scorer among all the factors.

The presence of services such as stalls, vigilance, rentals, etc., are always very well scored in urban beaches, but the difference from semi-natural is minimal. The latter are normally less valued due to the non-existence or certain lacks in these kinds of facilities. On the contrary, parking areas are the only item significantly more highly scored in semi-natural beaches as it is a very conflictive topic in urban areas where saturation and lack of space limits, or totally impedes, the possibility of parking close to the beach. In semi-natural beaches, this situation is faced with much less stress.

Accessibility, maritime boulevard and restaurant services offered close to the beach are greatly appreciated in urban beaches. They implicitly recognise the high value of transitional areas between sand and the corresponding urban area.

Those aspects related to image and comfort are most highly scored in semi-natural beaches (Fig. 7). Landscape has nearly the highest mark in both types of beaches which shows that both natural environment and urban villages on the Costa Brava are appreciated for their beautiful views.

The rest of the aspects are slightly better scored in semi-natural environments, but what is significant is the degree of satisfaction due to the fact that these beaches are less overcrowded. The most popular, touristy and overcrowded beaches have been more penalised, although this does not represent a real inconvenience for the users as the mark does not fall below 5.

Finally, the similar global evaluation is only a bit higher in semi-natural beaches which are less accessible and more peripheral which consolidates the idea that the beach users feel satisfied with the recreational activity provided.

The wide overview provided by the results obtained in the questionnaire and the in-depth interviews, provides us with a more comprehensive framework for discussing the policy implications of this kind of public perception study, aiming to offer an adaptive approach for beach management.

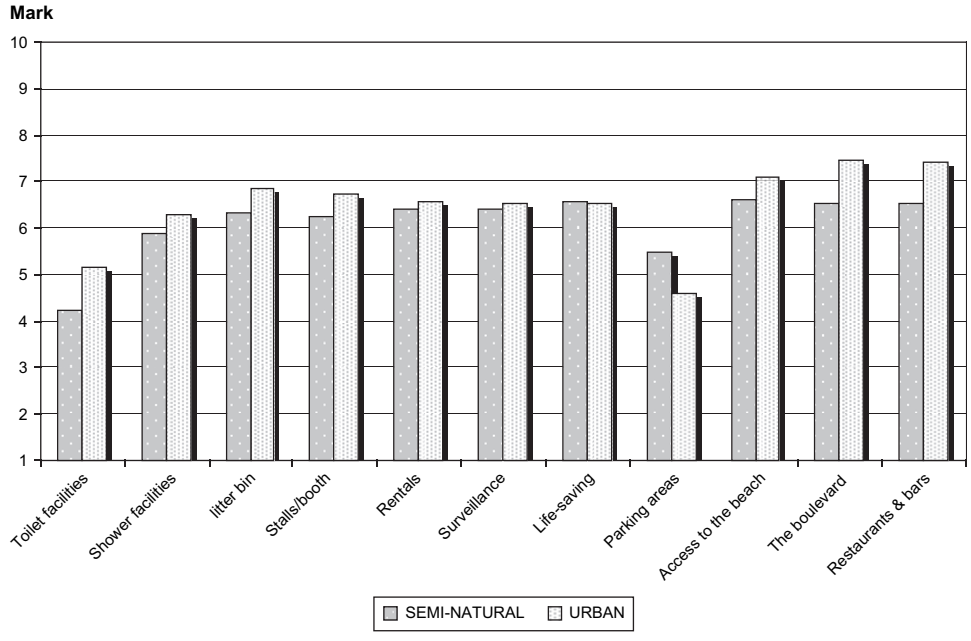

Fig. 6. Facilities and services.

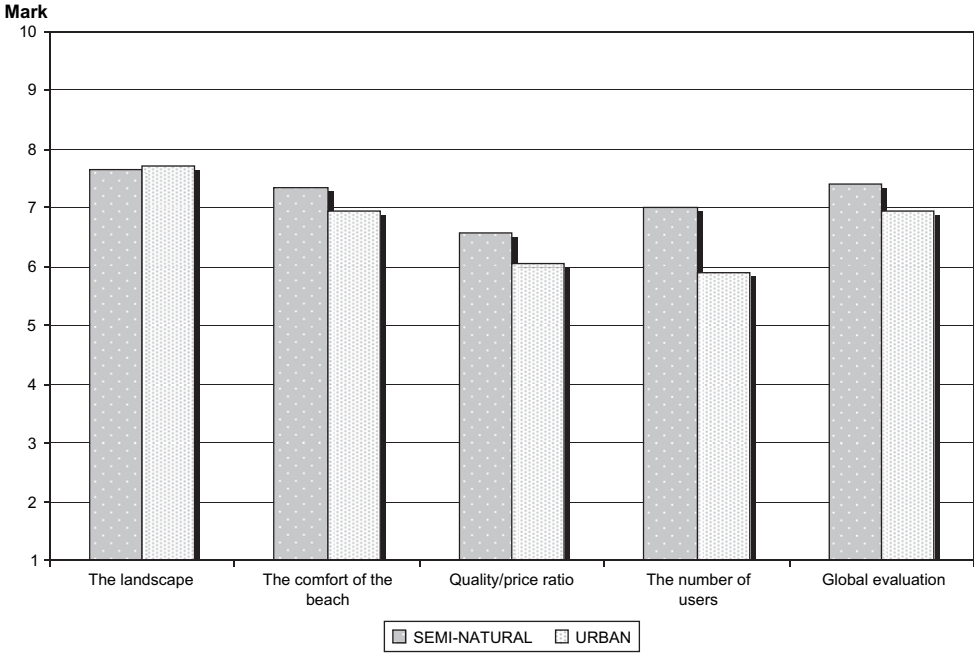

Fig. 7. Aspects related to image and comfort.

5. Discussion: Policy implications of public perceptions surveys

Our discussion approaches policy implication deduced from the public perception survey in our study cases in order to show the usefulness and relevance of this kind of studies. It is important to previously consider that one has to be careful when translating beach users' demands into management practices. As Breton et al. [15] also mentioned perceptions are cultural and mediatised values so their interpretation and uses should be made with caution.

Beach users' relationships with the environment are complex. People's recreational behaviour is indirectly affected by environmental quality, via the individual's formulations of their perception about their environment. At the same time, people approach natural areas in a different way and individual behaviour also depends on personal perception of the environment [30]. In this paper we have concentrated on the preferences of beach-users in relation to the characteristics of each specific beach in terms of recreation exploitation or conservation of the natural, from which management recommendations are discussed.

From the methodological side, this kind of survey is an efficient way to obtain public perception as the setting up is fairly easily done ''in situ'' and co-operation is obtained from interviewees who are enjoying a relaxing time on the beach and do not mind sharing such activities with answering a questionnaire. Obtaining results from nearly 700 interviews having to visit homes or work places or along the street would have meant an enormous additional effort and the results would not have been so representative.

In relation to the physical aspects, which are largely very much appreciated, few items have been penalised because they can alter the sensation of comfort and safety. We refer to the size, the slope to the sea, the texture of the sand and the presence of rocks. However, modifying or ''correcting'' these aspects is very arguable as they are part of the natural characteristics of the beach system. In the case of some urban beaches, beach users have suggested flattening the beach profile and local authorities can invest a lot of money to re-address sand shifts every year. In the case of semi-natural beaches closer to river mouths, demands for an increase in cleaning efforts to remove organic material brought by the river are made. In those cases, policy recommendations may be considered with caution as functions of the natural environmental system should be guaranteed.

Micallef and Williams [31] stated that the conservation of nature is not compatible with the improvement of recreational activities for mass tourism. However, in our study cases, coastal managers have to deal with very popular, touristy sites where landscape and natural connotations are the prime motivation for beach-users. Moreover, this topic

has been given the same importance to comfort and safety when users select a beach. Dealing with the complexity and multidimensionality of beach systems implies considering on the one hand, natural and physical conditions and on the other, the social uses which, we must not forget, are the basis of the local economies in the region. Principles of ecosystem management [32] should help to deal with this kind of situation, where coastal managers should prioritise ecological functions primarily and, as far as possible facilitate enjoyment of the public via activities in accordance with its recreational function [6]. In contrast, in the cases where the original, natural conditions have been modified to a large extent as in the case of those beaches along the front of very popular, touristic, urbanized areas that are very overcrowded, we recommend that in the peak season physical disturbances concerning beach profile, sand distribution and the presence of rocks can be addressed in order to increase safety, avoid accidents and facilitate accessibility and social use for the disabled, elderly people or children. A typical example of this kind of intervention could be the reshaping of the sub-aerial beach profile to flatten it, especially in steep beaches with a high berm. Results of this action will persist for most of the season provided wave movements are low enough not to reshape the beach. Once the first storms come along, the beach will naturally recover its typical shape.

In relation to environmental quality, beach users have highlighted their preference for sand and sea cleanliness over other types of aspects in all the beaches. This determines their strong demands in related items (''litter in the sand'' and ''in the water''). Beach users prefer more efficient and frequent beach and water cleaning, although according to Tudor and Williams [28], users are able to tolerate and accept a certain level of beach litter. A point to note is that users perceive visual pollution (debry, oil, litter), while sewage-derived contaminants are not regularly recognised by the public.

Therefore, efforts to maintain hygienic conditions are very important. This implies several strategies: on the one hand, the focus on social awareness to promote proper attitudes and behaviours and, on the other, increased investment in cleaning and placing more bins on the sand, even though this may imply an aesthetic disturbance. The delicate balance between conservation and recreation arises here again. The risk of overexploitation in some natural sites is warned of by Roig et al. [33] who defends soft-key management measures instead of providing answers to user demands that creates ''accultural'' models where the predominant function is recreational rather than the natural.

Thus, the provision of cleaning services should not be indiscriminate. On the one hand, efforts in urban beaches during the peak season must be guaranteed without interruption the whole day including mechanized as well as manually, which normally are local authorities' responsibility. In addition, it should be noted that these sort of beaches may be used for many other urban uses such as local festivities which should imply extraordinary cleaning campaigns. On the other hand, in semi-natural environments, the respect for scenic diversity and the natural surroundings of the beaches must be the main concern and the environmental information and communication should play a key role to raise the awareness of beach-users.

Urban beaches, with huge overcrowding during the peak seasons due to their easy accessibility, are associated with a certain degree of comfort provided by facilities and services. However, this implies a wide diversity of uses (stalls, rentals of sun beds, umbrellas, pedal boats, toilets, shower, boat beaching areas) competing for a very limited space which may be the source of dissatisfaction or discomfort. Thus, an early beach planning considering beach users diversity is needed in order to rationalize an efficient management and to minimize conflicting situations between different social uses on the beach.

Another set of aspects in high demand are those related to safety and surveillance. Life-saving should be correlated with the quantity of users. Thus, in urban beaches the presence of life-savers must be more intensive and the location of first-aid points is highly recommended. As we have already pointed out, the safety conditions for bathing are related to beach morphology so that it is important to provide these beaches with elements (e.g. wooden walkways) that can ease the enjoyment of all kinds of public, in particular the elderly or disabled.

While in developed beaches the sensation of comfort is linked to the provision of services and equipment, in the semi-natural ones these feelings are associated to less people and the fact that they conserve natural features (landscape, biodiversity) so that they can provide peace and contact with nature to their users. This is partly possible due to their limitations in accessibility and the lack of certain facilities which prevent a certain proportion of users from reaching and using them. Therefore, criticism regarding the lack of some facilities should be considered as secondary by coastal managers since investments made to increase recreational exploitation would imply the presence of more users.

The similar global evaluation and landscape scores puts forward the idea that perceptions are not only due to the different levels of conservation/development of beaches but also to the presence of variable beach user profiles that have different perceptions and interpretations of the environment.

These studies principally generate bottom-up information directly from beach users and local stakeholders. Nevertheless, we would give a word of warning that through this double-edged discussion of public perceptions the results must be taken very carefully when applied to public policy. This study highlighted that there is a differentiated beach user profile depending on beach type and a wide variety of perceptions are motivated by beach characteristics in terms of physical aspects, environmental status, facilities and services and landscape. Thus, a fine, careful interpretation of beach users' preferences, values and perceptions is crucial to design a more adaptive management model to local and specific characteristics of each type of beach, ranging from those more conservationist to those aiming at developing recreational activities.

6. Conclusions

In this paper we have studied the perceptions of beach-users for 6 beaches of the popular, tourist centre in the Costa Brava Region. As stated at the beginning of the paper, the aim of studying beach users' perceptions is to contribute to improving their recreational experience but also to address public attitudes and sensitivity towards ecological functions that beach systems provide.

The study has shown different users profiles enjoying different types of environments (urban and semi-natural). In general beach users are satisfied with their recreational experience, especially when it refers to biophysical and landscape characteristics. The high degree of satisfaction with the provision of services in urban and overcrowded beaches and the global approval of natural characteristics and conservation status in semi-natural beaches suggests that public perception is not only influenced by the specific characteristics of each beach but also depends on the beach userprofile. In the end, results have shown that users of each beach type are satisfied by their recreational experience. Taking into account the differences between the two beach types, we have a clear indication that we are not only faced with two different beaches but also two very different users. The message to the managers is very clear. They have to manage two different environments with two very specific types of user. Policy implications are that conservation strategies should be prioritised in natural environments, while interventionist approaches enhancing recreational beach functions should be oriented only to intensively used beaches, normally located along urban water fronts.

This approach, in combination with top-down quality awards, can provide more adaptive beach management not only taking into consideration beach users' expectations on the recreational values but also offering insights to address public attitudes in order to conserve beach ecological functions.

In the light of these conclusions, future research should explore how differences in perceptions are influenced by each type of social group to be found on the beach.

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