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Assessing users’ expectations and perceptions on different beach types and the need for diverse management frameworks along the Western Mediterranean.

Abstract

Beach management follows a homogeneous and rigid decision-making process that tries to fulfill expectations assumed from mass tourism without really getting to know the real users’ perception. Decisions are usually taken without considering the diversity of values of the beaches, causing high environmental, economic and recreational impacts. In this study, users’ profiles, expectations and perceptions have been defined on six Valencian beaches with both different degree of artificialization and sediment type. This has allowed a comparison between semi-natural and urban beaches, and between pebbly and sandy beaches. Differences between beach types have been observed, and a critical analysis of the current management framework and practices has been carried out. Therefore, decision-making should take greater account of users, and actions should be adapted to the diversity of beaches and their particularities, leading to a differential beach management.

Keywords: Beach management; User perceptions; Differential management; ICZM; Coastal planning

INTRODUCTION

Beaches present a great diversity in their degree of development, anthropogenic pressure, touristic exploitation, conservation, sediment type and geomorphology. Some characteristics, such as physical aspects, landscape, flora and fauna can enhance the potential attractiveness of the beaches (Micallef and Williams, 2002). They bring great economic benefits to society because of their recreational value (Gormsen, 1997; Sárdá et al., 2009), by developing a tourism sector based on the “sun and beach” resource.

In the Mediterranean, 500 million tourists per year are forecasted for 2030 (World Tourism Organization, 2013). This means that on coasts such as Valencian, in the Western Mediterranean, tourism constitutes an absolutely essential economic product (Obiol-Menero and Pitarch-Garrido, 2011; Yepes and Medina, 2005) that guides the coastal policies and decision-making.

This takes place in a context in which climate change and rising global temperatures are altering hydrodynamics and rising sea levels, affecting coastlines and increasing beach erosion (Bird, 1996; Gössling and Hall, 2006; Nicholls and Cazenave, 2010; Slott et al., 2006). That is the case of Valencian coast, affected by erosion over 26% of its length. (European Commission, 2009). These phenomena affect the basic resource that sustains tourist activity since the beach width required for user comfort is reduced or disappears (Valdemoro and Jiménez, 2006). Given their importance, and in order to maintain the benefits of the recreational use of beaches (Alexandrakis et al., 2015), erosion processes receive great attention from coastal managers. There are numerous nourishment projects and implementation of hard structures as protection measures against coastal and beach erosion, which entail the consequent economic cost and environmental impact (Aragonés et al., 2015; Peterson and Bishop, 2005; Rumbold et al., 2001; Speybroeck et al., 2006). In Spain, competences over the coast are distributed at local and national level (defined by the Spanish Coastal Law 2/2013). The physical maintenance of the beaches is taken at a national level, with nourishments focused on maintaining the beach size (Hanson et al., 2002). On the contrary, municipalities are responsible for managing the facilities and supplying the equipment, usually following beach award standards (Mir-Gual et al., 2015). Management may affect both the recreational function of the beaches (Ariza et al., 2010; Roca and Villares, 2008; Williams and Micallef, 2009) and the environment. As an example, this may happen with the seagrass residues removal (Cocozza et al., 2011; Duarte, 2004).

Beaches should be managed as the complex systems they are, guaranteeing the integrity of their natural values while ecological services are provided (Sárdá et al., 2015), following an Ecosystem Approach (Olsen et al., 2009). Nevertheless, in many cases the current management does not accomplish the environmental policy principles (Katsanevakis et al., 2011), and decisions are taken exclusively from the recreational point
of view (Ariza et al., 2008a; James, 2000; Sardá et al., 2015). A priori, the offer of facilities and equipment is made according to users’ attendance, preferences and needs (Peña-Alonso et al., 2018). However, managers infer users’ desires without really knowing their opinion before adopting changes (Nelson et al., 2000). Therefore, decision-making follows a non-inclusive and rigid process (Areizaga et al., 2012) with local vision and short-term perspective. Decisions try to please the mass tourism industry, receiving important pressure from the private sector and other influential stakeholders policy (Bramwell, 2011). This management model entails homogenization of the beaches (Lozoya et al., 2014), applying similar measures despite the diverse nature and different sediment type of the beaches. These actions promote a tourism model where environmental care is a secondary concern (Obiol-Menero and Pitarch-Garrido, 2011), damaging and overexploiting the coast (Amelung and Viner, 2006; Sardá et al., 2009).

Therefore, for a management adapted to beaches’ diversity it is fundamental to have more information about their environment and users. Regarding the beach as a physical space, an up-to-date knowledge of the width is essential for determining the available surface area, the carrying capacity (Cifuentes, 1992; Williams and Micallef, 2009) and, thus, to deal with density and overcrowding issues. With regard to users, it is necessary to know their affluence, but also their profile, interests, expectations, and opinions about the management measures adopted (Rodella et al., 2017). As stakeholders, their participation is essential for an Integrated Coastal Zone Management (ICZM) (Areizaga et al., 2012) with sustainable results (Milligan et al., 2009; Schmidt et al., 2013). Different studies have tried to answer the previous questions: some works have been carried out on recreational quality of beaches (Ariza et al., 2010; Peña-Alonso et al., 2018; Williams and Micallef, 2009), and dealing with users’ density, frequenation and crowding (Chen and Teng, 2016; DeRuick et al., 1997; Pereira da Silva, 2002; Roig-Munar, 2003; Sardá et al., 2009). Other authors have tried to define their opinions, perceptions and expectations (Alves et al., 2014; Cervantes et al., 2008; Lozoya et al., 2014; Marin et al., 2009; Mas-Parera and Blázquez-Salom, 2005; Monioudi et al., 2017; Roca and Villares, 2008; Rodella et al., 2017; Vaz et al., 2009). However, the vast majority of the studies focus on urban sandy beaches, without considering beaches with different substrate or artificialization degree. On the Valencian coast, despite the importance the tourism has for the region’s socioeconomics, studies of this nature are extremely scarce.

The objectives of this study are to identify differences in the expectations and perceptions of the users on different beach types, as well as to determine whether the current management responds adequately to this diversity.

DESCRIPTION OF THE BEACHES

Six Valencian beaches, on the Eastern coast of the Iberian Peninsula, were selected as representatives for this study. All six beaches have both different sediment size and artificialization degree in order to allow a comparison between different beach types (Fig. 1, 2).
Fig. 1. Location of the six beaches assessed in this study. Valencian coast, Western Mediterranean (ETRS89 UTM30N).

Fig. 2: Studied beaches: l’Auir, Gandia Nord, Piles, la Grava, Ambolo and Granadella.

Beaches were classified based on beach features, facilities and surroundings. These aspects were defined from the information available in the Spanish Catalogue of Beaches (MAPAMA, 2017), by fieldwork, and by a GIS analysis of the land use in the coastal hinterland (Tab. 1). Urban and semi-natural beaches were distinguished according to their degree of artificialization. Urban beaches were defined as those located in dense urban areas, with easy access and touristic accommodations, high level of services, and limited by a promenade. On the contrary, semi-natural beaches are those with scattered settlements in the hinterland, low level of touristic facilities and accessibility, and without promenade. These criteria are in line with previous beach classifications (Ariza et al., 2008a; Roca and Villares, 2008; Vaz et al., 2009). At the same time, beaches also have been classified according to the sediment size between sandy and pebbly beaches.

Tab 1. Beach classification and main characteristics. The information has been partly obtained from the Catalogue of beaches (MAPAMA, 2017).
From North to South, the first three beaches are sandy. The first one, l’Auir is a semi-natural wide beach located at the northern end of the municipality of Gandia, with a coastal front not urbanized and with dunes. It offers minimum services and activities related to water sports (like windsurfing and kitesurfing) and has a nudist area and a dog-friendly area. To the South, it borders on Gandia Nord, a very wide urban beach with a highly developed coastal front. The beach is delimited by a promenade, with numerous establishments, terraces, hotels and apartments. This beach also offers a wide range of services, activities, sports areas and kiosks. Some kilometers to the South, Piles is another urban beach, bordered by a promenade with few establishments, followed by low-rise apartments. It is a relatively narrow beach with erosive problems (Cabezas-Rabadán et al., 2018).

In the South, three pebbly beaches are considered. La Grava is an urban beach supported by the port of Xàbia and the promenade, in front of low buildings. The last two beaches are located on the coast of Cap de la Nao. They are both semi-natural, surrounded by a scattered low-density urbanization, and “Penya-segats de la Marina” Site of Community Importance and Special Protection Area (CMA, 2015). Ambolo shows a mixture of pebbles and coarse sand, supported by a cliff. Access is complicated and only possible on foot. The beach does not offer services or Blue Flag, and nudism is common in one area. Finally, Granadella is surrounded by mountains, offers services and aquatic activities, and has Blue Flag.

As they are located close to each other, the main regional socioeconomic and environmental conditions are similar. Nevertheless, some differences appear on the tourist sector: it is developed more focused on the so-called quality tourism in the southern part of the study area, apparently more linked to natural values and the landscape, while on the contrary Gandia Nord constitutes an example of tourist resort oriented to the sun and beach mass tourism (Cambrils-Camarena and Nácher Escriche, 2005).

**METHODS**

**Questionnaires**

Questionnaires were conducted in order to assess user’s profile, the reasons for choosing a certain beach, activities carried out, priorities and perceptions. A simple random sampling following a zigzag pattern was carried out on each beach after determining the sample size with a confidence level of 95%, maximum variance (0.5) and an error of 15% (Cambarero, 2006). A total number of 264 useful oral interviews, 44 for each beach, were carried out between July 15th and August 15th, in the middle of the peak season. Questionnaires took between 10 and 15 minutes and were conducted mainly in Spanish, but also in English, French and Catalan. Questions were grouped into the following sections:

(a) Basic questions oriented to the definition of users’ profile such as their age, origin, educational level, residence, companions and aspects related to their visit to the beach;

(b) Users’ main reason for choosing the visited beach;

(c) Recreational activities on the visited beach;

<table>
<thead>
<tr>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal front</td>
<td>Dunes</td>
<td>Dense urbanization</td>
<td>Dense urbanization</td>
<td>Dense urbanization</td>
<td>Cliff</td>
<td>Mountains</td>
</tr>
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<td>Length x mean width (m)</td>
<td>1760 x 70</td>
<td>3000 x 80</td>
<td>1160 x 25</td>
<td>500 x 16</td>
<td>150 x 15</td>
<td>200 x 20</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
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<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
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<td>Yes</td>
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</tr>
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<td>Yes</td>
<td>Yes</td>
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</tr>
<tr>
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<td>Nudist, dog-friendly</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Nudist</td>
<td>No</td>
</tr>
</tbody>
</table>

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(d) Prioritized characteristics when choosing a beach, as well as identifying the most important one;
(e) Perception of facilities supply and environmental aspects.

Afterward, a descriptive analysis for each beach was carried out employing frequency diagrams. With the aim of assessing differences between beach types, the results of urban, semi-natural, pebbly and sandy beaches were aggregated. The proportion of answers in different beach types was conducted using a Z-test (Fleiss et al., 2004; Zar, 1999). Finally, users’ perceptions were also analyzed through frequency diagrams, and a weighted arithmetic mean was calculated in order to assess the perception of facilities supply.

Frequentation measures

During the same days the interviews were conducted, the number of users at each beach was determined between 12 a.m. and 3 p.m., as this time slot registers the greatest number of people on Mediterranean beaches (Breton et al., 1996; Mas-Parera and Blázquez-Salom, 2005; Roig-Munar, 2003). On each beach, and perpendicularly to the shoreline, 5-meters-wide stripes were defined covering both emerged and submerged beach areas. It was identified that the vast majority of users were located in a narrow stretch of 25 m close to the shore, which was defined as the useful beach area from the recreational point of view. This corresponds with the findings of previous studies (Alemany, 1984; Sardá et al., 2009; Yepes and Medina, 2007). Therefore, beach surface was defined up to that distance or, in narrower beaches, up to their inner limits. For this purpose, GIS software and PNOA orthophotos were used. From the number of users and the useful beach area an average beach density was calculated.

RESULTS

Users’ profile

The answers of 44 questionnaires allowed describing users’ profiles through their age (Fig. 3a), companions (Fig. 3b), origin (Fig. 4a), residence (Fig. 4b), educational level (Fig. 5a), usual beach (Fig. 5b), travel time (Fig. 6a) and time spent on the beach (Fig. 6b). Each beach showed a particular user profile.

L’Auir was mostly visited by adults (64%), who attended in pairs (46%), mostly from other parts of Spain (52%), or the municipality of Gandia (23%). Several users expressed that they came “from the coastal urban area of Gandia” where they stayed at their second residence (48%) or temporary residence as hotels or rental apartments (21%). However, they preferred to visit this beach instead of Gandia Nord. For the majority (71%), it was their usual beach and the time spent there was about 3-4 hours.

Gandia Nord received a large number of elderly (23%) and young people (48%), most of them from outside the Valencian Community (75%). The majority stayed in hotels and apartments (50%), although some users reported “long trips in public transport” for a beach day trip (11% spent more than 60 min). People spent long days on the beach (50% more than 5 h) and considered it as their usual beach (60 %).

Piles hosted a high percentage of users that considered it as their usual beach (80%), mainly families (71%) from Valencia province (68%). They came from their second residences (39%), habitual homes (34%), or rented close to the beach (27%).

La Grava was frequented mainly by families (73%), inhabitants of the municipality (23%), that made short trips (77% less than fifteen minutes) from their habitual residence (34%) to spend little time on the beach (46% less than 2 h). There were also foreigners and people from the Valencian community in second homes or temporary residences.

Ambolo was mainly frequented by young people (59%), possibly due to its complicated access, without considering it as their usual beach (91%). They came with friends (66%), from the Valencian community
(66%), directly from their home to spend a day at the beach, with no other accommodation nearby (75%).

174 Granadella was mainly visited by young (52%) groups of friends (48%), itinerant visitors attending to spend the day from their usual homes (20%), in the Valencian Community (34%). There were also visitors staying in hotels, campsites and apartments (41%), or in second homes (30%), many of whom were foreigners (18%).

178 Considering the different beach types, differences appeared in users’ profile: Young people preferred semi-natural and pebbly beaches, while elderly preferred the urban and sandy ones. Regarding the company, more families appeared on urban beaches, while groups of friends attended to semi-natural and pebbly beaches such as Ambolo and Granadella. Urban and sandy were chosen as the most visited beach, while on the contrary, foreigners and long day trips were linked to semi-natural and pebbly beaches. These differences are probably related to the particularities, services and activities that can be carried out on each beach and that may condition the beach choice.

Fig. 3. (a) Users’ age: youths (<30 years old), adults (30-60 years old) or elderly (>60 years old). (b) Companions: alone, couple, family or friends.

Fig. 4. (a) Hometown: same municipality, province, community or country where that beach is located, or abroad. (b) Residence or accommodation while they are visiting the beach.

Fig. 5. (a) Educational level: primary, secondary or post-secondary. (b) Usual beach.
Fig. 6. (a) Travel time to the beach (minutes): Less than 15, between 15 - 30, between 30-60, and more than 60. (b) Time spent on the beach (hours): less than two, three - four, five - six, more than six.

The main reason for choosing the visited beach

Users expressed their main reasons for choosing one beach, which differed a lot between them (Fig. 7). People attended to l’Auir mainly because of the quietness, being the only semi-natural beach in the area (52%). Gandia Nord users were attracted by its proximity and easy access (30%), and the atmosphere and “ease of meeting people and partying” on the beach and surrounding areas (23%). The tradition of attending every year was also very common, in several cases related to owning a holiday home (14%). Due to this same reason, the tradition was also the main reason for choosing Piles (41%), in addition to quietness (41%) and proximity (16%). La Grava received most of their users because of its proximity to their dwellings (50%), while tradition and quietness also played an important role (both 9%). Ambolo and Granadella attracted users mainly because of their landscape (55% and 57% respectively).

Recreational activities on the visited beach

The comparison between the proportion of activities in each beach type was carried out with a Z-test. Table 2 highlights statistically significant differences between semi-natural and urban beaches, and between sand and pebbly beaches.

Tab. 2. Results of the Z-test comparing the proportions of the main activities carried out in different beach types. Differences have been identified with 95% of confidence (*).
Recreational activities are often linked to different beach characteristics. Significant differences were found in sand sports, such as volleyball and football (4%) and beach paddle ball (14%), besides relax and sunbathing (47%), all of them much more common in urban beaches. Meanwhile, semi-natural beaches fostered in higher proportion aquatic sports (as windsurfing and kite surfing) (4%) and snorkeling and diving (49%). Comparing sediment types, snorkeling and diving only appeared in pebbly beaches, such as volleyball and football on sandy ones, where there were also far more popular walking (36%), beach paddle ball (16%) and playing with kids (9%).

Prioritized characteristics when choosing a beach

Beach users consider some elements when they choose a certain beach. They classified each characteristic as very important, relevant or not important (Fig. 8). In general, the most valued characteristics were water quality and sediment cleanliness, while facilities, the presence of flora and fauna, and seashore slope did not have that much importance. Differences appeared in certain characteristics when comparing the users of different beach types.

Urban beach users prioritized more water quality and sediment cleanliness, proximity from their residences, and the facilities offered by the beach more than semi-natural ones. On the contrary, semi-natural users paid more attention to quietness, landscape and the presence of flora and fauna. With regard to pebbly beach users, they paid closer attention to water quality, landscape, and the presence of flora and fauna, while users on sandy beaches considered sediment cleanliness, proximity and facilities.

![Fig. 8. Priorities when choosing a beach: water quality, sediment cleanliness, quietness, landscape, proximity, facilities, flora and fauna, and slope on different beach types: (a) semi-natural vs. urban, (b) pebbly vs. sandy beaches.](image)

In order to determine if there were significant differences between diverse beach types, each user identified their most valued characteristic. Table 3 compares the proportions of users on each beach type, and the Z-test allows identifying differences for some characteristics.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Proportion in:</th>
<th>p-value</th>
<th>Proportion of users:</th>
<th>p-value</th>
<th>Significantly higher:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relax &amp; sunbathing</td>
<td></td>
<td></td>
<td>0.2045</td>
<td></td>
<td>0.0000*</td>
</tr>
<tr>
<td>Walking</td>
<td>0.1591</td>
<td>0.2045</td>
<td>0.3371</td>
<td>0.0076</td>
<td>0.0000*</td>
</tr>
<tr>
<td>Playing with kids</td>
<td>0.0530</td>
<td>0.0530</td>
<td>1.0000</td>
<td>0.0152</td>
<td>0.0000*</td>
</tr>
<tr>
<td>Beach paddle ball</td>
<td>0.0303</td>
<td>0.1439</td>
<td>0.0011*</td>
<td>0.1591</td>
<td>0.0152 0.0000*</td>
</tr>
<tr>
<td>Aquatic sports</td>
<td>0.0379</td>
<td>0.0000</td>
<td>0.0238*</td>
<td>0.0076</td>
<td>0.0303 0.1770</td>
</tr>
<tr>
<td>Snorkeling &amp; diving</td>
<td>0.4848</td>
<td>0.0530</td>
<td>0.0000*</td>
<td>0.0000</td>
<td>0.5379 0.0000*</td>
</tr>
<tr>
<td>Volleyball/Football</td>
<td>0.0000</td>
<td>0.0379</td>
<td>0.0238*</td>
<td>0.0379</td>
<td>0.0000 0.0238*</td>
</tr>
</tbody>
</table>

Tab. 3. Results of the Z-test with 95% (*) and 90% (**) of confidence, comparing the proportion of users that chose each characteristic as the most valued when choosing a beach.
The proportion of users who chose sediment cleanliness (25%), facilities (5%) and atmosphere (4%) as the most important element was significantly higher on urban beaches, while on semi-natural the most important factor was water quality (35%) and landscape (16%). In relation to sediment, sandy beach users paid significantly more attention to sediment cleanliness (25%) and quietness (32%), while pebbly users focus their choices on water quality (44%) and landscape (17%).

**Frequation and density**

Table 4 shows the affluence of users and the density during the peak periods. There were important differences in user density between the different beaches. L’Auir had the lowest occupancy level (24.5 m²/user), while Gandia Nord had the highest (2.3 m²/user). The lowest amount of users was detected on Ambolo and Granadella, both semi-natural, small and narrow beaches. However, due to their little available surface area their densities were higher than expected (7.6 and 5.1 m²/user respectively), comparable to the urban beaches of la Grava (4.5 m²/user) and Piles (7 m²/user).

Tab. 4. Useful beach area (m²), estimation of the total amount of users and the density (users/m² and m²/users).

<table>
<thead>
<tr>
<th>Beach</th>
<th>Useful beach area (m²)</th>
<th>Total No. users</th>
<th>Density (users/m²)</th>
<th>Density (m²/users)</th>
</tr>
</thead>
<tbody>
<tr>
<td>l'Auir</td>
<td>44000</td>
<td>1795</td>
<td>0.04</td>
<td>24.5</td>
</tr>
<tr>
<td>Gandia Nord</td>
<td>75000</td>
<td>32700</td>
<td>0.44</td>
<td>2.3</td>
</tr>
<tr>
<td>Piles</td>
<td>25600</td>
<td>3642</td>
<td>0.14</td>
<td>7.0</td>
</tr>
<tr>
<td>la Grava</td>
<td>4229</td>
<td>941</td>
<td>0.22</td>
<td>4.5</td>
</tr>
<tr>
<td>Ambolo</td>
<td>2049</td>
<td>270</td>
<td>0.13</td>
<td>7.6</td>
</tr>
<tr>
<td>Granadella</td>
<td>2567</td>
<td>507</td>
<td>0.20</td>
<td>5.1</td>
</tr>
</tbody>
</table>

**Beach width perception**

Figure 9 shows users’ perception of the beach width, sometimes inadequate for the recreational functions. **Excessive**

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**Tables and Figures**

<table>
<thead>
<tr>
<th>Sediment cleanliness</th>
<th>Urban</th>
<th>Sand</th>
<th>Pebbles</th>
</tr>
</thead>
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<td>0.11364</td>
<td>0.2500</td>
<td>0.00410*</td>
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</tr>
<tr>
<td>0.35606</td>
<td>0.20455</td>
<td>0.00614*</td>
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<td>0.18939</td>
<td>0.18352</td>
<td>sand</td>
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<td>0.00000</td>
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</table>

**Excessive**

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**Figures and Graphs**

- [Image of beach width perception](image_url)
Fig. 9. Users’ perception of beach width.

On pebbly beaches (La Grava, Ambolo and Granadella), between 20% and 25% of the users considered the beach as too narrow. Those are small pebbly beaches and users occupy a large part of their surface during peak seasons. Piles, a sandy beach with erosive problems, registered similar answers and 16% of its users stated that it did not present appropriate dimensions. On the contrary, 25% of the users on Gandia reported that the beach was too wide, “making uncomfortable to reach the seashore”.

Users’ density and overcrowding perception

Users were asked to classify the perceived amount of people as “many”, “quite a lot”, “few” or “very few”, as well as if they experienced discomfort because of overcrowding. Figure 10 compares the densities with the percentage of users perceiving “many people” and overcrowding discomfort.

Fig. 10. On the left axis: density of users (users/m²). On the right axis: percentage of users perceiving “many people” and overcrowding discomfort.

Apparently, users’ density was not necessarily related to the perception of crowding, or at least to the discomfort it caused. Gandia Nord reported a very high density (0.44 users/m²), and a large proportion of the users was aware of this situation, and 52% perceived many people. Nevertheless, they were not so dissatisfied with that as only 25% perceived overcrowding. On the contrary, the highest proportions of overcrowding perception were recorded on the semi-natural beaches of Ambolo (36%) and Granadella (34%), although the densities (0.13 and 0.20 users/m² respectively) were considerably lower than on Gandia Nord. The situation was similar on the other beaches: l’Ahuir experienced the lowest density (0.04 users/m²), but the percentage of users perceiving many people and overcrowding was similar and higher than on Piles and la Grava, that on the contrary showed far higher densities (0.14 and 0.22 users/m² respectively). Therefore, considering the actual densities and the beach type, semi-natural users showed a higher perception of people on the beach and higher overcrowding discomfort, while urban users were more satisfied with the situation.

Facilities perception

For each service, users classified the offer into four categories. Values were assigned to each category: excessive (-1), unimportant (0), adequate (+1), insufficient (-1). They allowed assessing the suitability of the offer, penalizing in equal measure if the offer is perceived as excessive or insufficient. From these values and the proportions of users associated with each category, a satisfaction score was calculated as a weighted average (ranging from +1 to -1). Figure 11 ranks the facilities according to the satisfaction score.
Fig. 11. Facilities offer perceived as insufficient, adequate, not interested and excessive. The facilities are ranked from left to right according to their satisfaction score.

The differences in facilities supply on each beach were reflected in users' perceptions. However, other factors seemed to influence this perception, impeding the assertion that the more services are provided, the better the satisfaction. The users of Gandia, a mass tourism-oriented beach that offers a huge amount of services, appeared as very pleased, and only complained about the insufficient parking (48%). The situation was different on Piles, where several users complained about the lack of services (more than 50% perceived insufficiency of kiosks and umbrellas). Ambolo, without facilities on the beach, had some users complaining the same way, although the majority showed no interest in the facilities and considered their presence as unimportant. The lack of certain facilities could also be identified on l’Auir (80% considered a lack of toilets), la Grava (more than 60% considered insufficient showers and toilets) and la Granadella (showers and toilets, but also the lack of parking). On the contrary, on Granadella a significant proportion (25%) complained about the excessive number of parasols and sunbeds, also registered on Gandia Nord (9%) and la Grava (7%). Similarly, on l’Auir (9%) and la Grava (11%), the aquatic activities caused complaints about altering the tranquility, one of the most valued characteristics of those beaches.

Blue Flag perception

Users showed a significant lack of knowledge with regard to beaches’ possession of Blue Flag: only 43.2% knew if the beach had the award. The perception of Blue Flag differed between beach types (Fig. 12). For example, urban users were more conscious about the presence of Blue Flag on the beach (55%) than semi-natural users (31%). This lack of knowledge was in line with the low influence that the award had in people’s
beach choice: only 40% on urban and 28% on semi-natural beaches considered it. At the same time, it is important to point out that several users asserted not knowing the function of that award.

![Image of Blue Flag perception chart]

**Fig. 12.** Beach users’ awareness and perception regarding the Blue Flag.

**Seagrass residues perception**

The presence of *Posidonia oceanica* residues on the shore is common on the three southern beaches, and they are routinely removed as solid waste. Figure 13 shows users’ perception about seagrass residues on those beaches.

![Image of disturbance by seagrass residues chart]

**Fig. 13.** Perception of disturbance by residues of the seagrass *Posidonia oceanica*, according to i) Type of beach where the survey was done, ii) Users’ origin in relation with that beach, iii) users’ education level.

Most people were not bothered by the presence of residues (57%), especially on semi-natural beaches (61%). About users’ origin, disturbances affected fewer foreigners (11%) and visitors from distant places in the Community (35%) than those coming from shorter distances, such as locals (77%) or people from other parts of Spain (57%). Disturbances have also been compared considering the level of education, and greater rejection was found among people with primary level (62%), compared to secondary (32%) and higher education (40%).

**DISCUSSION**

Users’ profiles, expectations, activities and perceptions have been defined on different types of beach. Some results were similar on all the studied beaches, and therefore some general trends can be identified. This is consistent with previous studies, which show that majority of users tend to be restful, and only a small proportion engage other activities (Alves et al., 2017; Breton et al., 1996; Lozoya et al., 2014). Nevertheless, each beach has different values, either environmental or recreational, that may constitute users’ main reason for attending to a certain beach. Sometimes they are linked with specific recreational
activities as certain sports. The tradition was another common reason, with users attending to the same beach every year. In many cases, that was related to the proximity of their residence, which reduces the time to reach the beach. This issue can be especially remarkable for people attending with their families. In the study area, approximately two-thirds of the users (except those on Ambolo) were accommodated either in a temporary or in second homes. It is linked to the common presence of second residences on Western Mediterranean coast (Roca et al., 2008; Yepes and Medina, 2005), also reported in other Mediterranean beaches (Rodella et al., 2017). Thus, practical criteria such as the distance to the beach nearby act several times as the main reason for the election. However, these reasons must be differentiated from the most prioritized or valued elements on a beach. In this sense, water quality and beach quality and cleanliness are the most common prioritized elements when choosing a beach (Fig. 8). This matches other recent studies according to which water quality and cleanliness are essential factors in the choice (Rodella et al., 2017; Vaz et al., 2009). Despite this, they are not the ultimate reason for choosing one beach over another (Nelson et al., 2000; Vaz et al., 2009).

Differences between beach types

Regardless of these general trends, differences appear when grouping beaches with the same degree of artificialization (urban or semi-natural) and sediment size (sand or pebbles). Differences in users’ profile may be observed, with more youths and groups of friends on semi-natural beaches, and more elderly people and families on urban beaches. This is probably related with the level of comfort that children require. On urban beaches, users attended on foot to their usual beach, in short trips, commonly from their second residence, while on semi-naturals travels were longer and more time was spent there. That was especially remarkable on Ambolo, where 66% of the users spent more than 60 min traveling to spend the day there. Probably that constitutes the motivation for considering it as a complementary beach, chosen “from time to time to have different experiences”.

Sediment size constituted a basic conditioner of the activities carried out. Therefore, a significantly higher percentage of users went to sandy beaches to walk, play with children or practice sports like beach paddle, volleyball or football. On the contrary, many users visited pebbly beaches to practice diving and snorkeling, which is a widespread activity. With regard to the degree of artificialization, relaxation and sunbathing were the most common activities and took place significantly more frequently on urban beaches, followed by beach paddle and sand sports. On the other hand, semi-natural beaches were dominated by water sports such as windsurfing and snorkeling.

Prioritized characteristics are also different on each beach type. On pebbly beaches, a significantly higher number of users considered water quality and landscape as their most prioritized characteristic. At the same time, flora and fauna, were apparently also more valued (Fig. 8). On sandy beaches, sediment cleanliness, facilities and quietness were strongly prioritized, with more interest also in proximity. Semi-natural users appreciated more water quality, landscape, quietness, flora and fauna, while on urban beaches sediment cleanliness, facilities and the atmosphere were preferred.

Our results show how urban beaches have a fairly defined and more traditional user profile that gives more priority to comfort, in line with previous works (Lozoya et al., 2014; Vaz et al., 2009). Furthermore, on semi-natural beaches, we found a particular user profile attracted to environmental values. These natural features, not available in the nearest beaches, seem to justify longer displacements, and lead us to think these users give a greater value to this type of beach, something defended by other authors (Lozoya et al., 2014; Peña-Alonso et al., 2018; Rodella et al., 2017; Vaz et al., 2009). This could be related to growing public interest in nature and other aspects beyond facilities and infrastructure (Lucrezi and Saayman, 2014), as well as the existence of different segments of tourist demand for coastal destinations that pay different attention to the environment (Onofri and Nunes, 2013).
It is important to note that, in the Valencian coast, sandy beaches have constituted the main recreational resource and attraction for the sun and beach tourism (López-Olivares, 2003). Pebble beaches traditionally have a lower level of artificialization, urbanization, and exploitation, linked to a lower level of accessibility, and have focused less attention on managers, offering fewer services and comfort. All this causes that certain similarities between pebbly and semi-natural beaches may be observed.

Individually, each beach shows specific values, either environmental or recreational, that may constitute the main reason for attending to it (Fig. 7). The landscape was the most important reason for attending to certain beaches (55% on Ambolo, 57% on Granadella), as well as the practice of diving and snorkeling associated with the presence of interesting aquatic flora and fauna (9% on Ambolo). The socio-economic environment surrounding each beach also played an essential role. The leisure possibilities on Gandia Nord, with music and parties in kiosks, as well as the nightlife in the surroundings, constitutes a good attraction for certain type of user. Other authors have described similar phenomena in Catalan (Roca et al., 2009), Italian (Rodella et al., 2017) and Mexican resorts (Cervantes et al., 2008). Sometimes management responds or encourages specific interests, creating great success in the affluence to the beach: the possibility of attending with pets justified the attendance of some users to l’Auir (20%). Similarly, the presence of several users practicing nudism in the authorized areas on l’Auir and Ambolo leads us to think that this practice is an important motivation for many users.

Therefore, getting to know individuals’ preferences and perceptions, together with site characteristics becomes an important issue for tourism management, as they determine beach choice (Halkos and Matsiory, 2012), and they are not as homogeneous as traditionally considered.

Beach width, density and overcrowding perception

Widths were sometimes perceived as insufficient on the pebbly beaches, naturally narrow (15-20 m), but also on Piles (25 m width) and even on l’Ahuir (70 m wide). Users seem to be quite demanding about the width of the beach and perceive the current situation as negative for their enjoyment. Previous works do not define a preferred beach width, and differences have been found in different study areas (Rodella et al., 2017). Nevertheless, it is assumed that width must be maintained over 30 – 35 m for the proper recreational use (Jiménez et al., 2011; Sardá et al., 2009). Either way, the physical maintenance of a surface capable of accommodating users and recreational functions constitutes an essential issue for managers (Rodella et al., 2017), and therefore, widths’ perception is essential to define the need for actions. The insufficient width on Piles associated to erosive processes, familiar to all Valencian coast (European Comission, 2009) hinders a stronger development of the economy in these areas, closely linked to sun and beach tourism (Gormsen, 1997; Sardá et al., 2009). This has led to different nourishment actions by the Spanish Ministry of Environment (Dirección General de Costas, DGC) in order to maintain the width during the tourist season. When width starts to be perceived as insufficient, the private sector and local governments force coastal managers to take measures to confront erosion, sometimes leading to emergency actions without long-term planning or perspectives (Jiménez et al., 2011), sometimes ineffective after a short period. In general, these interventions are associated with important economic cost and environmental impacts (Aragonés et al., 2015; Hanson et al., 2002; Peterson and Bishop, 2005; Speybroeck et al., 2006). Considering the high attractiveness of pebbly beaches for some users, on irremediably erosive beaches it could be proposed to increase the sediment size during nourishments as a more durable alternative.

However, on Gandia Nord, (wider than 80 m) the opposite situation was registered, and 25% of the users identified it as excessive, forcing them to walk more to reach the shore. This possibility has only been superficially explored (CEDEX, 2000; Villares, 1999) and contrasts with the current management, that does not consider this possibility and even suggests nourishments to exceed 60 m wide (Hanson et al., 2002).
Users’ perceptions should be included for more efficient decision-making. At the same time, the identification of beaches exceeding the acceptable width may be proposed and, given the shortage of sand along the coastline, they may be defined as donors of sediment.

Users’ density is another key parameter for the management, as it conditions the facilities that must be offered and can cause discomfort due to crowding (Breton et al., 1996; Rodella et al., 2017; Yepes, 2002). Several authors have suggested the saturation or overcrowding limit around values of 4–5 m², while under 2 m²/user would be unacceptable (Alemany, 1984; MOPU, 1970; Yepes, 2002; Yepes and Medina, 2007). In our study area, L’Auir registered a very low density (24.5 m²/user) comparable to the natural beach of Son Saura, in Menorca (Roig-Munar, 2003). Ambolo (7.6 m²/user), Piles (7 m²/user) y Granadella (5.1 m²/user), were also over the comfort threshold. On the contrary, la Grava (4.5 m²/user) was under the comfort level, and Gandia Nord, with about 2 m²/user was overcrowded. This value is lower than those registered in other Spanish urban beaches (Mas-Parera and Blázquez-Salom, 2005; Roig-Munar, 2003; Sardá et al., 2009), and comparable to Lloret de Mar (2.14 m²/user) (Roca et al., 2008), constituting an example massive tourism beach. Piles is a beach suffering significant erosion, unable to recover in the absence of nourishments. A decrease in its width may increase the density and consequently affect its recreational use (Jiménez et al., 2011; Valdemoro and Jiménez, 2006). It can also occur on the pebbly beaches of Granadella and la Grava: Although they are stable, sea level rising or increased frequentation can increase their density, already in the overcrowding limit, reducing their recreational attractiveness.

It is generally assumed that less crowded and less dense beaches are perceived as calmer and therefore more attractive (Vaz et al., 2009). Nevertheless, the problems associated with high density are ultimately defined by users’ overcrowding perception, and this one seems to be different depending on the type of beach. On semi-natural beaches, high densities seem to be perceived, and they generate overcrowding discomfort. On the other hand, this relation is not appreciated on urban beaches, and higher densities of users are not perceived and/or do not generate disturbances (Fig. 10). This could be due to the different users’ prioritization of beach characteristics: while users of semi-natural beaches value tranquility very much, on urban beaches this is not such an important aspect. In fact, one of the main motivations for coming to Gandia Nord, which has the highest density, is its atmosphere. Hence, as perceptions regarding density and comfort are not the same on all beaches and each one presents different characteristics, managers’ responses should not be the same either.

The highest perception of overcrowding appeared on Ambolo and Granadella (more than 30% of the users). They are both semi-natural and pebbly beaches with high environmental value. There, measures should be aimed at reducing the number of users, and in no case at increasing their width. Nevertheless, this is not usually contemplated on sandy beaches, where nourishments are typically considered. However, given their economic and environmental cost, measures should not systematically or exclusively focus on increasing the width so that it can accommodate all the desired users. An alternative solution is to reduce density by lowering the frequentation. The difficulty of access already acts as an efficient regulator on Ambolo, maintaining acceptable densities despite its small size. On the contrary, higher densities on la Grava and Granadella were related to their facility of access. In fact, a car restriction measure has recently been adopted on Granadella together with the implementation of public transport. This difficulty in accessing and parking has been shown to be related to lower frequentation (Pereira da Silva, 2002; Roig-Munar, 2003). Indirectly, it is possible to act on the tourist offer in the surroundings of the beaches, either by limiting the offer as it happens in the Balearic Islands (Mas-Parera and Blázquez-Salom, 2005) or with environmental taxation measures (Sanz-Blas, 2006). However, the most direct option is to implement an entrance fee, that at the same time can generate an economic resource for its environmental protection and maintenance (López-del-Pino and Grisolía, 2017). The acceptance of a fee has recently been assessed through the Willingness to Pay (WTP) (Alves et al., 2014; Lozoya et al., 2014).
The analysis of perceptions has allowed the identification of facilities causing discomfort between users (Fig. 11). Different perceptions appeared between beach types. On urban beaches, a greater number of facilities were perceived as a positive aspect and their absence as an unfavorable factor. On the contrary, several users on semi-naturals showed indifference or rejection towards the facilities: they described the offer as excessive, generating rejection for altering the landscape or the tranquility. This lack of interest in facilities was also observed when analyzing the prioritized characteristics for choosing a beach. Considering this, the current management strategy is inadequate: Despite managers’ efforts to increase beach facilities, users did not necessarily perceive it as a positive issue, and it even entails the risk of discomfort. This occurs because the decision-making process is carried out without user feedback to verify the adequacy of the measures taken.

This contrasts with the homogeneous management carried out based on mass tourism, which seeks to offer as many services as possible on the beaches, trying to satisfy all users, and entails a very significant financial expense. Municipalities have the autonomy to implement measures for managing beaches related to leisure and recreational activities, services or facilities. Theoretically, the provision of infrastructures and facilities is determined by users’ attendance, preferences, and expectations (Peña-Alonso et al., 2018), at least. As the particular management practices carried out on each beach cause differences on users’ perception and recreational experience (Ariza et al., 2010; Peña-Alonso et al., 2018; Roca et al., 2008) the analysis of perceptions carried out in this work appears as a useful tool to highlight facilities that beach managers should pay more attention to.

The Blue Flag

The Blue Flag is a performance award that attempts to guarantee a certain level of beach quality (Ariza et al., 2008b) in order to attract users. Nevertheless, results showed a high lack of knowledge and consideration of the award status of the visited beach, and several users did not know its purpose (Fig. 12). The Blue Flag also showed a small influence on beach choice, both on semi-natural and urban beaches. This is in line with previous studies, that reported a general lack of awareness (CREM, 2000; Dolch and Schernewski, 2002; Lucrezi et al., 2015). The higher awareness on urban beaches may be linked, on one hand, to a higher number of regular users and, on the other hand, to a higher prioritization of characteristics such as “cleanliness” and “safety and access” (Lucrezi and Saayman, 2014). Coastal towns compete for this award (Mir-Gual et al., 2015) due to its apparent effectiveness attracting foreign tourists (Capacci et al., 2015). Nevertheless, that contrast with the division in academic literature, with recent studies indicating a small influence attracting visitors and revenues (McKenna et al., 2011; Nelson et al., 2000).

The award is criticized due to not consider the heterogeneity of users’ expectations and perceptions (Morgan, 1999). It may contribute to the implementation of undesired facilities (Lucrezi and Saayman, 2014) as it has happened in the studied beaches (Fig. 11). The Blue Flag, similarly to other performance awards, is highly focused on the recreational function, leaving aside important environmental and ecosystem aspects of the beaches (Ariza et al., 2008b). The associated management practices carried out have received critics, as they may bring environmental costs and contribute turning beaches into “solairums” (Mir-Gual et al., 2015). There are doubts about the usefulness of this award as an indicator of good environmental condition (Lucrezi et al., 2016) and, in fact, awarded beaches sometimes have lower environmental values (Roig-Munar et al., 2018). These award schemes consider the same quality standards on any type of beach (Roca and Villares, 2008) leading to homogenization, and therefore they should not be taken as a reference standard in the management of these spaces.

Seagrass offshore residues
An example of the confrontation between the recreational function and the environment is the mechanical cleaning of the beaches, carried out to please the users (Lucrezi and Saayman, 2014). This practice removes seagrass residues, as it occurs with Posidonia oceanica (Roig-Munar et al., 2018), bringing negative effects by removing nutrients from the system and affecting the stability of beaches and the shallow meadows (Díaz-Almela and Duarte, 2008; Roig-Munar, 2001). Nevertheless, the results showed that the majority of users did not consider it as a nuisance. Differences appeared related to the type of beach, and rejection was higher on urban beaches (Fig. 3). About users’ origin, those from the municipality perceived the highest rejection while, on the contrary, foreigners registered the lowest percentage. The idea that foreigners may be attracted by the natural values when choosing their tourist destination (Onofri and Nunes, 2013) is possibly linked with higher levels of environmental awareness (CREM, 2000). Furthermore, seagrass residues were considered as a nuisance by a lower percentage of users with post-secondary than primary education. It may be caused by their higher knowledge of seagrass environmental values, in line with the relationship between educational level and environmental awareness already defined by different authors (Aminrad et al., 2011; Santos et al., 2005).

That confrontation between rejection of seagrass residues and environment shows how users’ preferences should be included in decision-making, but with caution. Some pretensions are based on the imaginary of sun and beach tourism, and they are short-sighted, misinformed, impossible to accomplish, or conflict with the environment (Lozoya et al., 2014). Environmental consciousness may play a very important role in the perception of the seagrass, especially significant considering the general unawareness of Posidonia’s functions (Roig-Munar, 2001). Environmental education could bring a higher knowledge of seagrass importance, reducing users’ rejection and constituting an alternative to the withdrawal.

Public awareness and differential beach management

Coastal management should aim to satisfy beach users, but also to educate and raise their awareness of environmental values. Education and public awareness have been proved as effective tools for handling the relation of tourists with the environment (Orams, 1997; Padua, 1994) and can raise public awareness about coastal problems and ICZM (Koutrakis et al., 2011). Once users are informed, their opinions and perceptions are undeniably valid and can be integrated into management processes (Lozoya et al., 2014). This is essential in order to avoid the current rigid and top-down approach that sometimes conflicts with users (Prati et al., 2016), as well as to supply guidelines for management schemes (Lucrezi et al., 2016). Users, together with local managers and formal stakeholders are necessary for implementing an Ecosystem Approach (Ariza et al., 2012; Sardá et al., 2015). It is currently the dominant paradigm (Olsen et al., 2009) attempting a sustainable use of natural resources while maintaining their ecosystem integrity. Schemes as Blue Flag award have proven not to be useful for guiding the management, and they should act as complementary tools in order to take advantage of their educational component (Lucrezi and Saayman, 2014). More integrated systems with a holistic vision should be adopted for monitoring and managing the beaches (Lucrezi et al., 2016; Sardá et al., 2015). These tools should be able to consider all the characteristics of these ecosystems, as well as users’ opinions, favouring a management adapted to the diversity of beaches, promoting their natural values and enhancing or emphasizing their particularities (Lozoya et al., 2014; Peña-Alonso et al., 2018; Vaz et al., 2009). However, it should be noted that the higher number of visitors on the urban beaches, Gandia Nord in particular, suggests that mass tourism-oriented management is now meeting the interests of many more beachgoers. Spanish Coastal Law 2/2013 supports a differentiation between the exploitation of urban beaches and the preservation of values on those isolated from urbanized areas. Managing the coast as a whole and strategic zoning (Lucrezi et al., 2016) can help in this task, and emphasizing values as landscape, flora and fauna can increase its attractiveness (Lozoya et al., 2014; Micallef and Williams, 2002). This can bring tourist benefits since the existence of beaches with different
characteristics can enhance the diversity of experiences offered and attract different segments of visitors (Onofri and Nunes, 2013).

Conclusions

Management must maximize recreational use and tourism benefits without sacrificing environmental values. In order to do it, it must be adapted to the values of each beach and to its users. Our results demonstrate that users’ interests are not homogeneous, and management is based on assumptions sometimes uncertain that compromise the environment. Therefore, a change in the policies adopted and in the decision-making is mandatory. It is necessary to adopt mechanisms to get to know stakeholders’ opinions, instead of inferring and assuming them. This makes essential to study not only the generalist expectations and perceptions typical in sand mass tourism but also those related to the diversity of beaches and users.

In order to respect the environment, a more diversified and individualized management has to be developed, considering the coast as a whole, and its diversity as a potential. Moreover, when recreational interests are in conflict with natural values, education may be a great ally increasing environmental awareness and changing users’ expectations. All this may lead to a better conservation of the coast, especially important considering the value these areas have for our society.

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Highlights

Semi-natural and urban, and pebbly and sandy beaches showed differences in users’ preferences, expectations and perceptions.

The results contrast with the homogeneous and rigid decision-making practices that take place.

Management should be diversified and adapted considering the diversity of beaches and their values.

Mass tourism conflicts with environmental interests, and environmental education may help to raise users’ awareness.

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