

Article

# Exploring Environmental Awareness and Behavior among Guests at Hotels That Apply Water-Saving Measures

Ariadna Gabarda-Mallorquí \* , Rosa Maria Fraguell and Anna Ribas 

Department of Geography and Institute of Environment, University of Girona, 17004 Girona, Spain; rosa.fraguell@udg.edu (R.M.F.); anna.ribas@udg.edu (A.R.)

\* Correspondence: ariadna.gabarda@udg.edu; Tel.: +34-972-419-716

Received: 26 February 2018; Accepted: 20 April 2018; Published: 24 April 2018



**Abstract:** The aim of this study was to investigate guest profiles at a hotel that has created a best-practices water management model to determine how different types of guests contribute to saving water during their stay. To do this, we analyzed levels of environmental awareness and pro-environmental behavior among the guests. Information was gathered through 648 structured surveys with guests at Hotel Samba in the Spanish seaside resort of Lloret de Mar between September 2015 and August 2016. Cluster analysis revealed four profiles of guests with different sociodemographic characteristics and different levels of awareness and proactivity in relation to water conservation. We combined our findings to develop a framework that illustrates how the two dimensions of environmental awareness and pro-environmental behavior are related in this setting. This article provides new insights into how hotel guests' environmental awareness and engagement can influence a hotel's water-saving efforts. These insights should help hotel operators to devise new, guest-centered strategies for saving water.

**Keywords:** water-saving measures; environmental awareness; pro-environmental behavior; hotels; guests; tourism; Costa Brava

## 1. Introduction

Water is one of the most sought after natural resources, particularly in areas with frequent drought and high water stress, such as the Mediterranean Basin [1]. Competition for water between different economic sectors is also common in water-scarce regions [2]. Tourism is a fast-growing industry [3,4] that is strongly dependent on water for recreational and consumptive purposes, and the challenge lies in finding a way to meet the needs of tourists without jeopardizing those of local residents [5,6]. Changing rainfall patterns and overexploitation of water resources have led to a serious decline in both the quantity and quality of water throughout the Mediterranean Basin [7]. Measures aimed at reducing water use are therefore essential for maintaining a balance between socioeconomic development and the preservation and restoration of ecosystems [8].

Increasingly aware of the importance of sustainable water management, more and more hotels are implementing strategies aimed at reducing consumption [9,10]. Such strategies, however, require the collaboration of hotel guests and to date very little is known about how guests use water during their stay [11,12]. Guests can contribute to reducing water consumption in the hotel industry first by choosing a hotel with a sustainable water management system [13] and second by helping to save water during their stay [14–16]. These steps are directly related to two key concepts: environmental awareness and pro-environmental behavior. Awareness, understood as a person's concern for their impact on the environment, has been described as one's ability to detect and recognize factors that can

help to protect the environment [17]. It would be logical to assume that an environmentally aware person would automatically display pro-environmental behavior [18–20], but this is not always the case [21,22]. As reported by Gregory and Leo [23], people who are concerned about the impact of human activity on water resources are not always proactive about saving water.

The aim of this study was to investigate whether different types of guests at a hotel that champions good water-saving practices actually contribute to reducing water consumption during their stay. To do this, we explored their levels of environmental awareness and pro-environmental behavior in relation to water conservation.

## 2. Theoretical Framework

Water-conservation strategies increasingly form part of environmental management programs in the hotel industry. Examples are installation of water-saving devices in taps [5], employee and guest awareness campaigns to enhance savings [24], and careful tracking of water usage through automated water meter devices [25]. Hotel operators can be driven to save water for numerous reasons [26,27], including lowering of operating costs [28–30], compliance with environmental regulations [31,32], and concern about conveying a green image through environmental certification and other programs [33,34]. Apart from specific measures, such as bed linen/towel reuse programs and the installation of dual-flush toilets, there are also passive measures that require minimal or even no action from guests, such as the installation of efficient water use systems and the promotion of best practices in hotel gardens, grounds, laundries, and kitchens. In general, however, maximum effectiveness is achieved when both parties are committed to minimizing water waste—the hotel by installing the necessary equipment and promoting best practices and the guests by behaving responsibly during their stay [13]. Active engagement of guests is thus crucial for maximizing water saving in a hotel [35,36].

Numerous factors have been proposed to explain why a hotel guest might be willing to actively contribute to achieving a hotel's environmental goals [37]. The two main factors related to water conservation are environmental awareness and pro-environmental behavior. Environmental awareness has been defined as “one's ability to identify a number of symbols, concepts, and behavior patterns related to environmental protection” [17] (p. 131). It is a key factor in any decision-making process involved in the consumption of goods or services [38]. Thus, theoretically, hotel guests with a high level of environmental awareness would be expected to have good water-saving habits [39,40]. The second factor, pro-environmental behavior, refers to conscious actions taken by humans to minimize their impact on the environment. It is a variable, dynamic behavior that can change depending on where the person is [37]. Some people, for example, have been found to use more water when they are on holidays than when they are at home [41].

Environmental awareness and pro-environmental behavior can also be influenced by sociodemographic factors, such as age, gender, country of origin, income, and level of education [42]. Age is claimed to be one of the best predictors of differences in pro-environmental behavior [43] and according to some studies, older people have more sustainable water consumption habits [23]. In a cluster analysis of 1264 UK households in Devon, Gilg and Barr [44] found that the respondents with the highest mean age (55 years) tended to have better water-saving habits. Similar results were reported by a study of 728 households in the Bulgarian city of Blagoevgrad [45] and by another of 602 households in the United States [46].

Gender differences in environmental awareness and behavior are believed to be determined by the social roles attributed to men and women [11]. Some studies have indicated that women are generally more environmentally proactive than men. This was the conclusion of a study based on a survey of 7379 readers of National Geographic undertaken by the University of Clemson (Clemson, SC, USA) and sponsored by the National Science Foundation (Alexandria, VA, USA) to explore whether reading classic environmental literature would foster greater environmentally responsible behavior [47]. Another study of determinants of pro-environmental behavior among 2226 university students from Spain, USA, Mexico, and Brazil between November 2009 and May 2011 found that women were

more environmentally proactive than men [17]. That said, other studies have concluded that there is insufficient evidence to show that men and women have different levels of environmental awareness and behavior, such as a study of 1697 members of the general public in the United Kingdom [38], the study in Blagoevgrad [45], and a study of 166 inhabitants in the city of Kaohsiung in southeast Taiwan [43].

Income and level of education have also been identified as potential determinants of environmental awareness and behavior. In the former case, Lam's study of Kaohsiung [43] showed a significant positive association between family income and intention to save water, while Clark and Finley [45], in their study of Blagoevgrad, found no evidence of this link. There are also conflicting reports on the role of education. While some studies have found that people with a high level of education tend to display more sustainable attitudes due to a greater awareness of the environmental impact of human activities [17,43], others have found a low level of education to be associated with a greater inclination to save water [23,45]. Finally, in the UK study by Gilg and Barr [44], the group with the highest levels of environmental awareness was formed mainly by people with primary and/or secondary education but also included individuals with a university degree. In brief, level of education and income do not appear to be a good predictor of environmental awareness or pro-environmental behavior [48].

### 3. Case Study: Lloret de Mar and Hotel Samba

Lloret de Mar is a well-known international tourist resort on the Costa Brava, a stretch of the Spanish Mediterranean coastline in the Catalan province of Girona. With a surface area of 48.7 km<sup>2</sup> and a population of 37,042 inhabitants (data from 2016), Lloret de Mar has 120 hotels and close to 30,000 beds. It is the largest resort in the region and the fifth largest sun-and-sand tourist destination in Spain in terms of numbers of beds (data provided by Lloret Turisme, Lloret de Mar, Spain). In 2016 alone, Lloret de Mar's hotels received 1,205,495 visitors.

One of these hotels, Hotel Samba, is renowned for its environmental management practices and in particular its exemplary application of water-saving measures. This three-star hotel, owned by Samba Hotels, has 441 double rooms and was the first hotel in Europe to earn two international environmental certifications: the ISO 14001 environmental management system standard in 1998 and the Eco-Management and Audit Scheme (EMAS) in 1999. It also possesses certification from the Catalan Environmental Quality Guarantee system, which requires holders to undertake specific actions related to water management and reduction of consumption. One of its greatest success stories is an efficient gray water reuse system that returns used water to the toilet cisterns. Since the installation of this system in 1997, the hotel has saved over 160,000 m<sup>3</sup> of water and currently boasts consumption levels of under 100 liters per person per day.

Hotel Samba is thus a good example of best practices in water management in the Spanish and even the European hotel sector [10]. As such, it is an ideal choice for investigating the extent to which guests contribute to the hotel's reduction in water use during their stay.

## 4. Methodology

### 4.1. Sample and Instruments

The first step in designing the survey and calculating the sample size was to form a panel of experts to guide and validate the design and planning process. The panel was formed by the Manager of Hotel Samba, one environmental officer and two receptionists from the hotel, a postdoctoral researcher specialized in quantitative methodology, and the technical/scientific team responsible for surveying the guests and entering the data into a database. The content of the questionnaire was based on a review of the literature and key observations that emerged during meetings with the members of the expert panel. Together with the environmental officers from the hotel, the research team analyzed a questionnaire that had been used some years earlier to identify areas for improvement errors and

optimize the reliability of the new questionnaire. To facilitate the work of the interviewers and prevent pages from becoming lost or mixed up, the questionnaire was formatted to occupy just four pages printed on both sides of an A3 sheet. The answers to all the questions were recorded by placing a tick next to the corresponding answer. The final version of the questionnaire was produced in the four main languages used by the guests at Hotel Samba: Catalan, Spanish, English, and French. Guests staying at Hotel Samba were interviewed between 1 September 2015 and 31 August 2016. They were approached in the hotel lobby and asked if they would like to answer a short survey on their stay. Those who agreed were surveyed on the spot by one of two interviewers. The surveys were held on two randomly selected days a month (one in the first half of the month and the other in the second). Each survey lasted for approximately 10 min and was anonymous. To check the reliability of the survey method, a scientific coordinator from the study met the interviewers twice a month to discuss possible difficulties and detect/correct differences in the data collection procedure. The coordinator also accompanied the interviewers to the hotel during the busiest months. Finally, the coordinator and interviewers had frequent contact by email and telephone during the data collection and database entry periods.

According to data provided by the hotel, 51,955 guests stayed at Hotel Samba in 2014 (Table 1). Assuming a margin of error of 5%, we calculated the minimum number of guests we would need to interview for the sample to be representative. Before being questioned, each guest was asked if this was their first night at the hotel. If it was, they were not interviewed, as it was considered that they would not have had enough time to form an opinion regarding certain points covered in the questionnaire. A total of 648 interviews were conducted.

**Table 1.** Available population and sample by season.

Season *	2014 Population	%	Sample (5% Error)	%	Surveys Conducted	%
High	23,324	44.89	324	55.60	256	39.50
Mid	16,760	32.26	172	29.45	182	28.08
Low	11,871	22.85	87	14.96	210	32.40
Total	51,955	100.00	583	100.00	648	100

\* High season: June, July, August, September; midseason: March, April, May, and October; and low season: January, February, November, and December.

#### 4.2. Study Variables

The questionnaire had four sections: (1) sociodemographic profile; (2) type of stay; (3) familiarity with the hotel's water-saving measures (environmental awareness); and (4) water-saving habits during stay at the hotel (pro-environmental behavior). Section 1 included questions on age, gender, country of origin, employment, and level of education. To determine type of stay in Section 2, guests were asked if they were travelling alone or with their family, friends, partner, or work colleagues. In another question, they were asked how they had booked the hotel (tour operator, travel agent, telephone, hotel website, e-mail, online travel agency). To assess their loyalty to Hotel Samba, they were asked how often they had stayed at the hotel. Finally, they were asked how many days they would be staying in total. In Section 3, they were asked why they had chosen to stay at Hotel Samba. The idea of this question was to assess their level of environmental awareness by determining if they were familiar with the hotel's water-saving systems. They were able to choose any number of items from the following list: (1) price; (2) environmental certifications held by the hotel; (3) quality of amenities; (4) good water-saving practices; (5) the hotel's reputation as one of the top hotels in Lloret de Mar; and (6) location. In another question in this section, guests were asked how they had found out about the hotel. This question was also devised as a way of investigating the guests' awareness of the importance of reducing water consumption in the hotel industry. They could choose any number of answers from among the following: (1) Internet and social media; (2) publicity; (3) travel agency; (4) recommendation from a trusted friend; and (5) the hotel's reputation as a leader in water-saving measures. They were

also asked how many water-saving devices or initiatives they had noticed in the hotel. Finally, in Section 4, to evaluate their water-saving habits as a measure of pro-environmental behavior, they were asked to indicate on a 5-point Likert scale ranging from 1 (never) to 5 (always) how often they had done the following during their stay at the hotel: “I have used the same towels for more than one day”, “I turn off the tap when I brush my teeth”, “I turn off the shower when I am soaping”, “I use hot water sparingly”, and “I distinguish between the small and large buttons when flushing the toilet”.

#### 4.3. Statistical Analysis

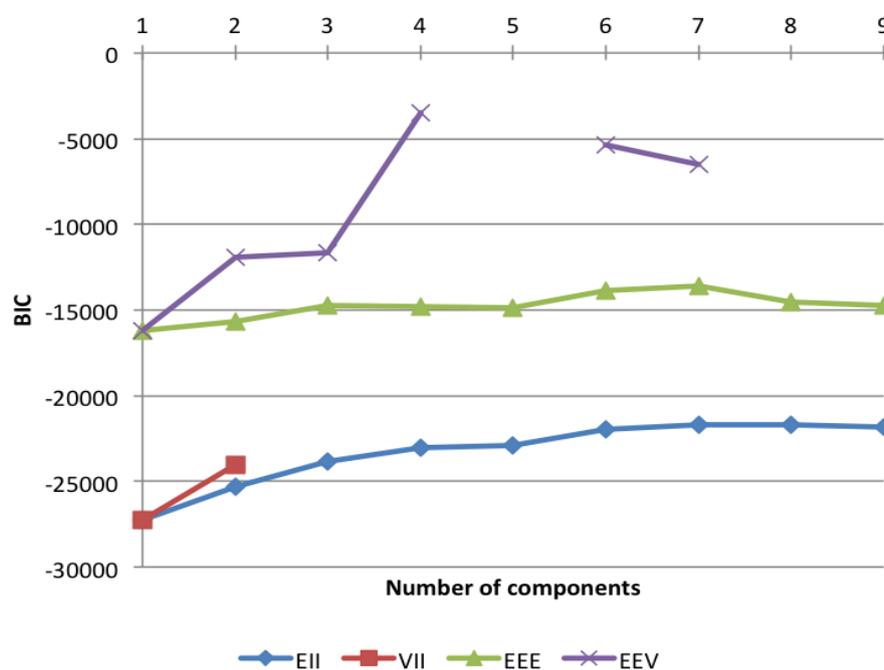
The main sociodemographic characteristics are shown in Table 2.

**Table 2.** Sociodemographic characteristics of sample.

	Variable	No. of Guests	%
Age, years	<25	155	23.91
	25–65	278	42.90
	>65	215	33.17
Gender	Female	327	50.46
	Male	321	49.54
Country of origin	Germany	50	7.72
	Belgium	66	10.19
	Spain	113	17.44
	France	204	31.48
	Italy	43	6.64
	Russia	34	5.25
	United Kingdom	69	10.65
	Other	69	10.65
Employment	Business owner with paid staff	54	8.33
	Business owner without paid staff	2	0.31
	Self-employed	19	2.93
	Employee	155	23.92
	Student	147	22.69
	Unemployed	7	1.08
	Retired	261	40.28
	Other	3	0.46
Level of education	No studies	75	11.57
	Primary education	123	18.98
	Secondary education	180	27.78
	Higher education	270	41.67

Using the responses from Sections 3 and 4 of the questionnaire, we performed a cluster analysis to identify the main profiles of guests at Hotel Samba according to awareness of the importance of saving water and proactivity in contributing to these savings while staying at the hotel. Cluster analysis is used to identify individuals with similar characteristics and classify them into groups with high internal homogeneity (strong similarities within each group) but high external heterogeneity (strong differences across groups) [49]. One of the benefits of cluster analysis is that it provides a concise, comprehensive description of individuals with only a minimal loss of information. As there is no clear evidence that environmental awareness directly leads to good water-saving habits [21,47,48], we opted to explore these two factors via a cluster analysis of the descriptive data collected. To do this, we converted all the variables into dichotomous variables and established “season” (high, mid, or low) as the categorical variable because it enabled us to predefine each of the clusters by different profiles of guests who stay at the hotel over the period of a year. The cluster analysis was performed in Mclust version 5 (Department of Statistics, University of Washington, Washington, DC, USA, 2017) [50], an R package [51] for model-based clustering, classification, and density estimation based on finite Gaussian

mixture models [52]. The best result based on the Bayesian Information Criterion (BIC) was a 4-cluster model with an ellipsoidal distribution, equal volume, equal shape, and variable orientation (Figure 1).



**Figure 1.** Bayesian Information Criterion (BIC) for the different cluster solutions analyzed. Note: EII (Spherical distribution, Equal volume, Equal shape); VII (Spherical distribution, Variable volume, Equal shape); EEE (Ellipsoidal distribution, Equal volume, Equal shape, Equal orientation); EEV (Ellipsoidal distribution, Equal volume, Equal shape, Variable orientation).

Using the four main profiles identified in the cluster analysis and the data from Sections 1 and 2 of the questionnaire (sociodemographic profile and type of stay), we determined the main characteristics of the hotel guests in the different groups according to age, gender, country of origin, employment, level of education, travel companions, booking channel, loyalty to Hotel Samba, and duration of stay. The nonparametric Kruskal–Wallis test was used to identify significant differences between the groups as it was assumed that the variables were non-normally distributed. The statistical calculations for this analysis were performed in IBM SBSS Statistics version 23 (International Business Machines Corp., Armonk, NY, USA, 2015).

## 5. Results

### 5.1. Guest Profiles Based on the Cluster Analysis

Table 3 shows the characteristics of the four clusters generated in Mclust.

- Group 1: Aware/Not Proactive (moderately aware of water-saving systems but low level of pro-environmental behavior).  
The aware/not proactive group contained 53 of the 648 respondents (8.18% of the population), making it almost identical in size to the smallest group, the aware/proactive group, with 52 guests. The vast majority of guests in the aware/not proactive group had stayed at the hotel during the high (45.28%) or midseason (50.94%). They had chosen Hotel Samba for numerous reasons, but the main ones mentioned were price (84.91%), location (67.92%), and amenities (49.06%). Although the hotel's environmental certifications and water-saving practices were at the bottom of the list of reasons for choosing Hotel Samba, they were still mentioned by 26.42% and 22.64% of guests, respectively, and only the aware/proactive group had a higher proportion of guests who

mentioned water-saving practices as a reason for choosing Hotel Samba. The guests had found out about the hotel mainly through a travel agency (60.38%) or the Internet/social media (35.85%). None of them had heard about Hotel Samba's water-saving initiatives. Over three-quarters (77.36%) had not noticed any water-saving measures, and 22.64% had noticed just one. Together with the not aware/not proactive group, this group had the worst water-saving habits; 81.13% used hot water sparingly, 77.36% turned off the shower while soaping and used the dual-flush buttons, 67.92% reused their towels, and 60.38% turned off the tap while brushing their teeth.

- Group 2: Not Aware/Not Proactive (not aware of water-saving systems and low level of pro-environmental behavior).

The not aware/not proactive group was the largest group identified in the cluster analysis, with 351 guests (54.17% of all respondents). It was also the group with the greatest seasonal distribution: 36.75% of the guests stayed at the hotel during the low season, 35.04% during the high season, and 28.24% during the midseason. The reasons mentioned for choosing Hotel Samba were less diverse than in other groups. Price was mentioned by 76.64%. None of the guests mentioned the hotel's good water-saving practices or environmental certifications. Similar to Group 1, they had mostly found out about the hotel through a travel agency or the Internet/social media. None of them were familiar with the hotel's pioneering water-saving initiatives. The vast majority of guests in this group (89.17%) had not detected any water-saving measures, but 9.69% had noticed one. This group had the worst water-saving habits of the four groups; 92.31% turned off the tap while brushing their teeth, 83.19% used the dual-flush system, 77.78% used hot water sparingly, 70.09% turned off the shower while soaping, and just 54.99% reused their towels.

- Group 3: Aware/Proactive (moderately aware of water-saving systems and moderate level of pro-environmental behavior).

The aware/proactive group was the smallest group, with just 52 guests (8.02%). It also had the highest proportion of guests who stayed at the hotel during the high season (61.54% vs. 38.46% for midseason). Although the reasons for choosing the hotel were highly variable, the most common ones were price (80.77%), trustworthiness (69.23%), amenities (50%), and location (50%). The hotel's water-saving practices and environmental certifications were mentioned by a considerable proportion of guests (34.62% and 46.15%, respectively). The group varied considerably in terms of how they had found out about the hotel: 61.54% mentioned a travel agency, 50% a person they trusted, 38.46% the Internet or social media, and 34.62% the hotel's reputation as a champion in water-saving practices. The aware/proactive group also had the highest proportion of guests who detected the water-saving measures in place, with almost half (46.16%) noticing at least one; 11.54% had noticed three or more measures, 3.85% had noticed two, and 30.77% had noticed one. The guests were also more proactive when it came to implementing the water-saving measures installed or promoted by the hotel. They all turned off the tap while brushing their teeth, 92.31% turned off the shower while soaping, 88.46% used hot water sparingly, and 80.77% used the dual-flush buttons. This group, however, had the lowest proportion of guests who reused towels (42.31%). This is probably because 61.54% of the group had stayed at the hotel in June, July, August, or September, which are months when towels are probably used (and changed) more often. Nonetheless, the guests in this group were moderately proactive and performed better than the other three groups when it came to contributing to the hotel's efforts to reduce water consumption.

- Group 4: Not Aware/Proactive (not aware of water-saving systems and moderate level of pro-environmental behavior).

The not aware/proactive group contained 192 guests (29.63% of all questionnaire respondents). Most of the guests had stayed at the hotel during the high or low season (40.10% vs. 41.15%). The two main reasons mentioned for choosing Hotel Samba were price (65.63%) and trustworthiness (29.17%). Although considerably higher rates were observed in the two aware groups (Groups 1 and 2), 6.25% of the guests in the not aware/proactive group did mention the

hotel's water-saving practices among the reasons for choosing the hotel. In total, 94.79% of the guests had found out about Hotel Samba through a travel agency. This percentage is much higher than the rates found in the other three groups. The vast majority of guests (87.5%) did not notice any of the water-saving measures in place; 11.46% had noticed one and 1.04% had noticed three or more. The not aware/proactive group performed best in terms of contributing to the hotel's water-saving initiatives. All the guests turned off the tap and the shower while brushing their teeth or soaping and they also all used the dual-flush system and hot water sparingly. Finally, 70.31% (the highest proportion across the groups) reused their towels.

**Table 3.** Guest profiles according to cluster analysis.

	Group 1 Aware/ Not Proactive	Group 2 Not Aware/ Not Proactive	Group 3 Aware/ Proactive	Group 4 Not Aware/ Proactive
	53 (8.18%)	351 (54.17%)	52 (8.02%)	192 (29.63%)
<b>Season</b>				
High	45.28	35.04	61.54	40.10
Mid	50.94	28.24	38.46	18.75
Low	3.77	36.75	0.00	41.15
<b>Dimension 1 Environmental Awareness</b>				
<b>Reasons for Choosing Hotel Samba (Multiple Answers Possible)</b>				
Price	84.91	76.64	80.77	65.63
Environmental certifications	26.42	0.00	46.15	5.21
Quality of amenities	49.06	1.71	50.00	13.54
Good water-saving practices	22.64	0.00	34.62	6.25
Trustworthiness	33.96	14.53	69.23	29.17
Location	67.92	18.23	50.00	18.75
<b>Found out about Hotel Samba through (Multiple Answers Possible)</b>				
Travel agency	60.38	49.00	61.54	94.79
Internet and social media	35.85	48.72	38.46	0.00
Reputation in water management	0.00	0.00	34.62	3.13
Recommendation from a trustworthy person	30.19	0.00	50.00	5.21
Advertising	0.00	2.85	15.38	4.17
<b>Number of Water-Saving Measures Detected</b>				
None	77.36	89.17	53.85	87.50
One	22.64	9.69	30.77	11.46
Two	0.00	1.14	3.85	0.00
Three or more	0.00	0.00	11.54	1.04
<b>Dimension 2 Pro-Environmental Behavior ("Almost Always" and "Always" Responses)</b>				
Reusing hotel towels	67.92	54.99	42.31	70.31
Turning off tap when brushing teeth	60.38	92.31	100.00	100.00
Turning off shower when soaping	77.36	70.09	92.31	100.00
Sparing use of hot water	81.13	77.78	88.46	100.00
Appropriate use of dual-flush buttons	77.36	83.19	80.77	100.00

## 5.2. Sociodemographic Characterization of the Clusters

In a second analysis, we linked the four guest profiles identified in the cluster analysis to sociodemographic variables and type of stay. The nonparametric Kruskal–Wallis test showed significant differences between the groups for age, gender, country of origin, employment, level of education, and booking channel (Table 4).

For each of the significant variables identified, we broke down the number and percentage of guests per group (Table 5). Overall, the results within each of the groups of variables were highly heterogeneous, giving the impression that the clusters were very similar. A closer analysis, however, revealed notable differences, which are discussed in the next section.

**Table 4.** Results of Kruskal–Wallis test.

	Index	df	Significance
<b>Sociodemographic Profile</b>			
Age, years	13.77	3	0.003 **
Gender	12.60	3	0.006 **
Country of origin	10.43	3	0.015 **
Employment	9.69	3	0.021 **
Level of education	7.11	3	0.068 *
<b>Type of Stay</b>			
Travel companion	2.86	3	0.412
Booking channel	11.86	3	0.008 **
Loyalty	5.37	3	0.146
Duration of stay	1.6	3	0.658

\*\* Significant at 0.05; \* Significant at 0.1.

**Table 5.** Results of Kruskal–Wallis test.

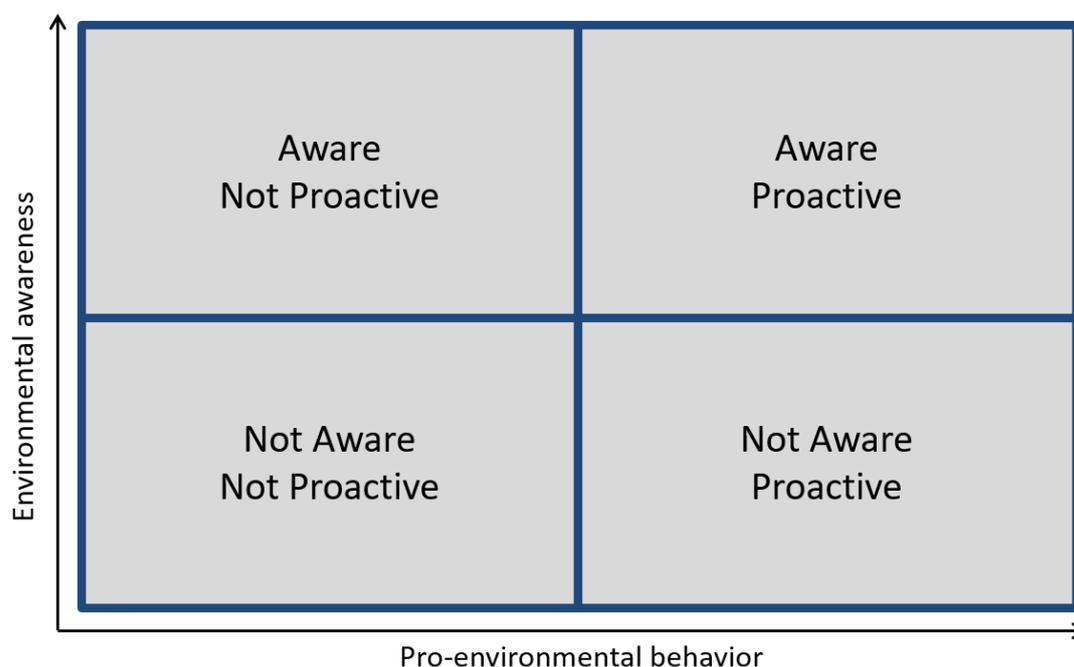
	Group 1. Aware/Not Proactive		Group 2. Not Aware/Not Proactive		Group 3. Aware/Proactive		Group 4. Not Aware/Proactive	
	(n = 53)		(n = 351)		(n = 52)		(n = 192)	
	No.	%	No.	%	No.	%	No.	%
<b>Sociodemographic Profile</b>								
<b>Age, Years</b>								
<25	15	28.30	93	26.49	15	28.84	32	16.66
25–65	29	54.71	142	40.45	24	46.15	83	43.22
>65	9	16.98	116	33.04	13	43.22	77	40.10
<b>Gender</b>								
Female	29	54.71	183	52.13	35	67.30	80	41.66
Male	24	45.28	168	47.86	17	32.69	112	58.33
<b>Country of Origin <sup>1</sup></b>								
Mediterranean area	28	52.83	190	54.13	29	55.76	113	58.85
Non-Mediterranean area	25	47.16	161	45.86	23	44.23	79	41.14
<b>Employment</b>								
Employed	21	39.62	126	35.89	20	38.46	66	34.37
Unemployed	4	7.54	2	0.56	1	1.92	0	0
Student	15	28.30	86	24.50	11	21.15	35	18.22
Retired	13	24.52	137	39.03	20	38.46	94	48.95
<b>Level of Education</b>								
No studies	5	9.43	37	10.54	2	3.84	31	16.14
Primary and secondary education	24	45.28	157	44.72	26	50	96	50
Higher education	24	45.28	157	44.72	24	46.15	65	33.85
<b>Type of Stay</b>								
<b>Booking Channel <sup>2</sup></b>								
Traditional channel	42	79.24	220	62.67	43	82.69	126	65.62
New technology	11	20.75	131	37.32	9	17.30	66	34.37

<sup>1</sup> Mediterranean countries included Spain, France, and Italy. Countries outside the Mediterranean area included Germany, Belgium, United Kingdom, Russia, and others; <sup>2</sup> Traditional booking channels include tour operators, travel agencies, and telephone. New technologies include bookings made through the website, email, or an online travel agency.

The aware/proactive and not aware/proactive groups had the highest proportion of guests over 65 (43.22% and 40.10%, respectively). Although the two groups differed in their awareness levels, they were both more consistent in displaying good water-saving habits during their stay than the other groups. The greatest difference in the distribution of male and female guests was observed in the aware/proactive group, where over two-thirds of the participants (67.30%) were women. Just over half of the guests were from Mediterranean countries in all four groups. The two groups with the highest proportion of Mediterranean guests were the aware/proactive (55.76%) and the not aware/proactive group (58.85%), while the group with the highest proportion of non-Mediterranean guests was Group 1, the aware/not proactive group. The employment situation of the guests was similar across the groups, with employed and retired people outnumbering unemployed people and students. The not aware/proactive group had the highest proportion of retired guests (48.95%). The two aware groups had the highest proportion of guests with a third-level education (45.28% in the not proactive group and 46.15% in the proactive group). Finally, the majority of guests in all four groups had booked their stay using a traditional booking channel (e.g., telephone or travel agency). Traditional channels were used most in the aware/proactive group (82.69%) while new technologies were used most in the not aware/not proactive group (37.32%).

## 6. Discussion

Cluster analysis of a representative sample of guests at a hotel that champions best practices in water conservation provided insights into how different profiles of guests contribute to saving water during their stay. In line with reports from other areas [21,23,48,53], the link between environmental awareness and pro-environmental behavior factors was not always linear, as can be seen in the diagram generated from our data (Figure 2), which shows how guests at Hotel Samba fall into one of four categories: aware/not proactive, aware/proactive, not aware/not proactive, and not aware/proactive.



**Figure 2.** Proposed reference framework based on the two dimensions analyzed.

The not aware/not proactive and aware/proactive combinations support the findings of numerous studies indicating that greater environmental awareness leads to high levels of environmental proactivity [18,54,55]. The guests in the aware/proactive group displayed good

water-saving habits during their stay at the hotel, while those in the not aware/not proactive group did not have a sufficient level of environmental awareness to induce adequate pro-environmental behavior.

Detection of the aware/not proactive and not aware/proactive combinations, however, indicates that it is not necessary to be environmentally aware in order to be environmentally responsible. This second observation is in line with reports from other studies that environmental awareness does not always lead to pro-environmental behavior [17,22,23,53]. Guests in the aware/not proactive group in our series were aware of many of the water-saving measures in place, but they did not appear to be particularly pro-active when it came to applying them. One possible explanation is that people have different water-consumption habits at home and on holidays [37,41,56]. The members of the not aware/proactive group appeared to have good water-saving habits, despite their low level of environmental awareness. This could be because they gain intrinsic satisfaction from using less water within a more austere lifestyle [57], it could be related to moral beliefs about what is right or wrong [58].

The higher proportion of guests aged over 65 observed in the two proactive groups supports reports that older people tend to use water more sparingly [23,44,45]. Roberts [46] suggested that older people might be more ecologically conscious because they continue to have a conservation ethic derived from having lived in more precarious times. Just over two-thirds of the participants in the aware/proactive group were women. Women tend to display more pro-environmental behaviors than men because they are more concerned about the well-being of others [17,44,47]. Nevertheless, the distribution of men and women in the other three groups supports previous findings that gender is not always a determinant of environmental awareness or behavior [43,45]. The aware/proactive and not aware/proactive groups had the highest proportion of guests from Mediterranean countries. Considering that previous experience has been identified as an important determinant of individual behavior [11,23], guests from countries affected by periods of drought might be expected to use water more responsibly, regardless of their level of environmental awareness. Finally, the aware/not proactive and aware/proactive groups had the highest proportion of guests with a third-level education. Vicente-Molina et al. [17] and Lam [43] have both shown that university graduates tend to be more aware of the importance of water conservation. In our series, 45.28% and 46.15% of the guests in the aware/not proactive and aware/proactive groups, respectively, had a third-level education. Nonetheless, as shown by the aware/not proactive group, having a higher education does not necessarily mean greater pro-environmental behavior, as 45.28% of the guests in this group had a university education. The above observation does not support the claims of Vicente-Molina et al. [17] and Lam [43], but rather shows, as suggested by the study by Gilg and Barr [44], that education has a more complex relationship with pro-environmental behavior than other sociodemographic variables. Our findings are actually more in line with reports by Gregory and Di Leo [23] and Clark and Finley [45] that good water-saving habits are more closely linked to low levels of education.

## 7. Conclusions

We have presented the case of a hotel that despite its water-saving efforts and low consumption rates receives guests with different levels of environmental awareness and pro-environmental behavior. Our findings show that a higher level of environmental awareness is not necessarily associated with environmental proactivity. Our profiling of the four groups identified in the cluster analysis revealed considerable sociodemographic differences from one group to the next. The most proactive guests in terms of contributing to water conservation during their stay at the hotel were older guests of any age or educational background living in a Mediterranean country.

Our study has some limitations. The first is related to the onsite interview-style data collection method. For future studies, it would be advisable to investigate alternative methods that would preserve anonymity and minimize response and nonresponse bias [59]. Another limitation is the single case design. Although Hotel Samba is a model of good water-saving practices and an ideal scenario for investigating environmental awareness, a case study is not sufficient for identifying strategies that can be applied to the hotel industry as a whole. More studies are needed to further explore and

add robustness to our findings. Similar studies could be conducted in other hotels in the Spanish Mediterranean area, such as Hotel Sunprime in Mallorca, which has a gray water recovery system similar to that in Hotel Samba. It would also be interesting to explore environmental awareness and pro-environmental behavior among hotel staff, as they obviously have a key role in water usage. Finally, in relation to the pro-environmental behavior of the guests surveyed, it should be noted that there is frequently a divide between what survey respondents say they do and what they actually do. As evidenced by other studies [60], self-report measures tend to overestimate behavior and may reflect a reality that is different to that observed using objective measures. Future studies should address this source of bias by incorporating objective evaluations of guest behavior.

Our findings point to some water-saving strategies that could be implemented by the hotel industry and public water management bodies. To maximize water use efficiency, hotels with successful strategies need to better convey their environmental goals to their guests by informing them, empowering them, and actively engaging them in a shared objective. Hotels, and green hotels in particular, are ideal settings for raising environmental awareness and mobilizing action. Awareness-raising strategies should ultimately aim to motivate guests to take action beyond their stay and spread the word of the water-shortage problems in the Mediterranean and of initiatives being taken in the hotel industry to address these problems. This could help to increase the number of guests interested in staying in a hotel with good water-saving practices and that is concerned about its impact on the environment. Finally, strategies that succeed in increasing pro-environmental behavior among guests will reinforce hotels' water-saving efforts and contribute to better overall water management in the sector.

Characterization of hotel guests through cluster analysis provides insights into different profiles of guests and helps to understand their water-saving habits while on holidays. Specific actions within the broader strategic goals of increasing environmental awareness and pro-environmental behavior should be based on positive reinforcement rather than "punishment". Campaigns promoting hotels' water-saving initiatives, for example, could be used to raise awareness in booking channels used by groups with low environmental awareness, and hotels could educate guests about water-shortage problems in the Mediterranean by installing infographics or audiovisual presentations in the lobby. They could even include environmental awareness and education activities in their entertainment programs or organize guided tours to show off their innovative water-saving measures. Finally, hotels with exemplary water-conversation practices, like Hotel Samba, should showcase these practices among the hotel's attractions.

In order to increase the pro-environmental behavior of "passive" guests, it would be interesting to explore ways of acknowledging and/or rewarding good water habits. Active engagement of guests throughout their stay should help to enhance overall water savings. This could be done by issuing certificates recognizing good behavior or applying discounts on hotel bills. Discounts for future stays, for example, would have a dual purpose: they would recognize and reward the guest's efforts and also help to motivate guest loyalty by encouraging repeat bookings. Money saved by responsible use of water by guests could also be assigned to sustainable tourism development projects, like the AccorHotel group's Plant for the Planet programme [61] in which trees are planted in areas with deforestation and/or water stress problems.

Public bodies also need to become actively involved if the efforts made by hotels and guests are to achieve true savings in the hotel industry. These bodies, for example, could design initiatives to promote and facilitate good water practices in the hotel industry and design certification schemes that include sustainable water management. Drawing on the experience of Hotel Samba, programs to encourage other hotels to follow suit and facilitate the transfer of know-how would also be interesting.

Our findings are consistent with previous studies that have found that guests are largely attracted to a hotel because of its prices and/or location, not because of its exemplary water-saving practices [62,63]. The application of water-saving initiatives can clearly help hotels to reduce their operating costs, but if these reductions are used to lower prices, there is a risk that this will place a

downward pressure on prices in the middle-range sun-and-sand market segment. If the aim is to target a new niche segment of green consumers, such a strategy will be counterproductive, as the hotel will continue to attract guests drawn largely by price. For a hotel, going green often requires large investments with lengthy payback times and it would therefore be desirable to see more and more guests prioritizing good environmental practices when choosing a hotel. Finally, to further enhance water-saving measures already in place, it is necessary, on the one hand, to establish reward schemes for both hotels and guests, and on the other, to target new market segments.

**Author Contributions:** Ariadna Gabarda-Mallorquí carried out the research and wrote the article; Rosa Maria Fraguell and Anna Ribas supervised the research proposal and methodology and acted as the research co-coordinators.

**Funding:** This study was supported by the Ministry of Economy and Competitiveness through the project “Analysis of trends and resilience strategies in use and water consumption in tourist areas. The case of the Costa Brava” (reference number CSO2013-41262-P).

**Acknowledgments:** The authors would like to thank Eduard Coloma, Hotel Samba manager, and Laura Pérez, environmental officer for their helpful contribution; and all the hosts who participated in the survey for their support in providing the data required.

**Conflicts of Interest:** The authors declare no conflict of interest.

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