

Article

# Understanding the Key Factors That Influence Efficient Water-Saving Practices among Tourists: A Mediterranean Case Study

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**Abstract:** The future of tourism activity is dependent on its ability to adapt to the effects of climate change. One of the most notable effects in the Mediterranean area will be water shortages in a scenario marked by increasing demand for this resource. While this situation will affect numerous economic sectors, it will have a severe impact on the tourism industry, which relies heavily on water. The aim of this study was to analyze water-saving practices among guests at campsites, hotels, and rural lodgings in the Muga river basin and investigate the factors that influence these practices. We conducted 752 surveys and found that differences in practices were influenced by reason for stay, type of accommodation, and geographic origin. A greater understanding of how sociodemographic and motivational characteristics influence water-saving behavior by guests at different types of tourist accommodation is essential for designing targeted strategies for improving environmental awareness and water-saving habits.

**Keywords:** good water practices; tourist accommodation; tourist; Mediterranean; water scarcity

## 1. Introduction

Water is an essential resource for the tourism industry. It is needed both for human consumption and to support key infrastructure and facilities, such as swimming pools, spas, and golf courses. Access to sufficient supplies of quality water is a growing concern in the industry, particularly in destinations prone to shortages due to the effects of climate change and growing demand [1]. Worldwide supply projections in the short and medium term are alarming, and Catalonia is no exception. A report published by the Catalan Government in 2016 [2] forecast a reduction in water availability of approximately 11% between 2015 and 2021 and 17.8% between 2015 and 2051. In addition, findings from the European Life MEDACC project [3] showed that summer rainfall in the Muga river basin (where this case study was conducted) decreased by approximately 60% between 1973 and 2013 and are expected to decrease by a further 7.5% by 2050. The projected reductions for spring and autumn rainfall are even higher, at 11.5% and 15.1%. This continued decline in rainfall over the decades has led to reductions in river flows. In the case of the Muga river basin, headwater flow decreased by 50% between 1973 and 2013 and is expected to decrease by an additional 20% by 2050. This worrying scenario, added to growing pressure on water resources from numerous economic sectors, calls for urgent action from all quarters, in particular the tourism industry and other key stakeholders with competing interests, such as industry, agriculture, and conservation groups.

The various players in the tourism industry need to adapt to the changing scenario and implement appropriate water-saving measures. Building on previous work by our group on perceptions of climate change among tourist accommodation establishment managers and incentives and barriers

to the implementation of water-saving measures in hotels in the Muga river basin, in this article we investigate factors that explain variations in water-saving habits among guests staying at campsites, hotels, and rural lodgings in the area. Information of this kind is essential for guiding the design of strategies aimed at increasing environmental awareness and fostering good water-saving habits among guests at hotels and other types of tourist accommodation.

The rest of this article is structured into seven sections. We first discuss the theoretical framework underlying our study and then describe the methodology and study area. Next, we analyze and discuss our results in light of the existing literature and close with a series of conclusions and practical recommendations for promoting best practices in water consumption and management.

## 2. Theoretical Framework

The tourism industry is one of the largest and fastest-growing industries worldwide, although it remains to be seen how it is affected by the novel coronavirus 2019 pandemic (COVID-19), at least in the short term. According to the World Tourism Organization of the United Nations (UNWTO, Madrid, Spain), international tourist arrivals worldwide grew by 5% in 2018 to reach a total of 1400 million [4], and this growth has an obvious impact on the accommodation sector [5]. International tourism, however, is highly sensitive to safety and security issues, as clearly evidenced by the COVID-19 pandemic. The industry has been one of the hardest hit sectors since the outbreak and the introduction of worldwide lockdown measures involving travel bans, closing of borders, confinement measures, and quarantine periods [6]. According to estimates by the UNWTO, international arrivals this year will fall by approximately 20% to 30% compared to 2019 [7], and one can expect Mediterranean countries with high caseloads, such as Italy and Spain, to be particularly hard hit. Restructuring strategies designed to build resilience to future crises are necessary, particularly in major tourist destinations.

Nonetheless, current efforts to combat the COVID-19 pandemic must not lead us to lose sight of other structural crises threatening the future of tourism—and humanity. Climate change [6] and overexploitation of natural resources [8] will continue to be global challenges with potentially devastating consequences. Fortunately, recent polls conducted by Ipsos MORI (Ipsos MORI, London, UK) in 14 countries, including Spain, the United States, Canada, and China, have shown that 70% of the population continues to consider climate change and environmental problems to be as serious a crisis as COVID-19 and that 65% of respondents believed that the fight against climate change should be prioritized in post-coronavirus economic recovery [9]. It is, therefore, more necessary than ever for key stakeholders to continue to take appropriate environmental decisions to facilitate the implementation of water-conservation measures that will protect both present and future availability [10–12]. A growing number of hoteliers and other accommodation owners are adopting measures aimed at increasing the sustainability of their business, while at the same time improving corporate image [13,14] and lowering operating costs [15–18]. Their actions can also help increase customer satisfaction and build loyalty [19] among a clientele that is increasingly aware of the detrimental effects of human activity on the environment. Recent years have witnessed the emergence of a new type of tourism characterized by visitors who prefer to stay at green establishments and who are willing to pay extra to do so [20]. That said, a report by the U.S. Travel Association (US Travel Association, Washington, USA) in 2009 [21] found that just 9% of clients were willing to pay more for green travel options. Without the engagement of guests, strategies adopted to promote efficient water use at tourist accommodation establishments will lose much of their effectiveness [22]. While it is true that the general public is increasingly aware of the importance of efficient water use, particularly since the turn of the millennium, considerable differences have been observed between what people do when at home and when on holiday, and, as reported by Barberán, Egea, Gracia-de-Rentería, and Salvador [23], Deyà and Tirado [24], Gatt and Schranz [25], and Gössling [26], the differences are even more striking when behaviors at accommodation establishments are analyzed.

A greater understanding of how tourists use water is essential for guiding the design of effective water-saving policies and measures. Water-saving habits in hotels and other establishments have been

analyzed in numerous studies. Examples of good habits are turning off the tap while washing your hands or brushing your teeth, turning off the shower while soaping, using a bucket to collect water as it is heating up, and choosing between the reduced- or full-flush options in dual-flush toilets [27,28]. Performance of these actions is closely linked to guest awareness of the need to save water, although the relationship is not always linear [29–31], some authors highlighted the importance of identifying what differentiated guests in terms of good and bad water-saving practices, as this would allow policy makers to more accurately identify target groups for awareness campaigns. Potential differentiating factors identified in the few studies conducted to date include sex, age, geographic origin, and level of education.

In a review of how sociodemographic characteristics influence or explain environmental behaviors, Diamantopoulos, Schlegelmilch, Sinkovics, and Bohlen [32] found that while men were more knowledgeable about environmental practices, women were more aware of and concerned about environmental problems and also more willing to engage in water- and energy-saving practices. Similar findings were reported by De Urioste-Stone, Le, Scaccia, and Wilkins [33] and Han et al. [19], who found that women and young people were more concerned about climate change and future water supply problems and also more proactive in their responses.

Gabarda-Mallorquí et al. [29] classified 648 guests surveyed at a hotel in Lloret de Mar (Girona, Spain) according to their level of environmental awareness and proactivity in terms of saving water and found that differences could be explained by age, sex, geographic origin, and level of education. In Greece, Dimara et al. [20] conducted 1304 online surveys to analyze factors that influenced guest participation in hotel towel reuse programs. They found that young guests, guests who had paid more for their stay, and guests who stayed for longer engaged in better environmental practices and were more willing to reuse towels. Wang et al. [34] found that reason for travel might also explain variations in behavior, as they found visitors at a natural park in Taiwan to be sensitive to the importance of water conservation. In particular, they found that visitors who showed the greatest proactivity in this regard were more knowledgeable about the negative effects of climate change on the landscape. In brief, there is growing consensus among key tourism stakeholders, including tourists, on the need to incorporate sustainable practices in this sector [35,36]. Sustainable water consumption and resource management are particularly important in the tourist accommodation industry [37] if we are to reduce the impact of tourism on our natural environment and ecosystems and in particular safeguard increasingly vulnerable water resources for future generations [38]. For this to occur, multilevel strategies incorporating local, regional, national, and global perspectives and involving all relevant stakeholders are needed.

### 3. Materials and Methods

We conducted a survey of guests staying at campsites, hotels, and rural lodgings in the Muga river basin to analyze their water-saving habits and investigate associations with sociodemographic and motivational characteristics.

To design the survey, we reviewed the literature to identify key factors associated with water consumption habits among tourists. The information retrieved was used to create a questionnaire validated by members of the Research Group on Water, Territory, Tourism, and Sustainability (GRATTS) at the Autonomous University of Barcelona and the University of Girona. The questionnaire contained 13 closed-ended questions, three sets of items rated on a 5-point Likert scale, and five open-ended questions. It was divided into four sections: (1) guest profile, (2) evaluation of water quality and resources at the establishment, (3) water-saving practices, and (4) general aspects of water consumption and climate change. Considering the diverse geographic origin of visitors to the study area, we prepared the questionnaire in four languages—Catalan, Spanish, English, and French—to avoid possible misinterpretations.

The survey was conducted on-site by interviewing guests at campsites, hotels, and rural lodgings in the Muga river basin. Eligible establishments were identified, and the majority were contacted by

email and telephone to arrange suitable times for conducting the surveys. Nineteen establishments (five campsites, ten hotels, and four rural lodgings) agreed for us to survey their guests (Table 1). We first interviewed the manager of each establishment and then surveyed the guests. The surveys were carried out in a public area (e.g., hotel foyer) at each establishment. We conducted 752 surveys; of these, 726 were validated for use in this study as they contained answers to all the questions of interest. The surveys were carried out in 2018, in the months of June (4.8%), July (38.6%), August (42.8%), and September (13.8%). They were therefore carried out during peak business months, when all establishments are open and at full or near-full capacity.

**Table 1.** Main characteristics of tourist accommodation establishments where guests were surveyed.

	Total Number in Study Area	Number of Establishments Where Guest Interviews Were Held
<b>Hotels</b>		
<b>Category</b>		
*	14	2
**	32	5
***	48	2
****	21	1
*****	2	0
<b>Total</b>	<b>117</b>	<b>10</b>
<b>Location</b>		
Inland	27	2
Cities	19	2
Coast	71	6
<b>Total</b>	<b>117</b>	<b>10</b>
Number of beds	11,231	531
<b>Campsites</b>		
<b>Category</b>		
1 (4-star campsite)	4	2
2 (3-star campsite)	7	2
3 (1-2-star campsite)	2	1
<b>Total</b>	<b>14</b>	<b>5</b>
<b>Location</b>		
Inland	4	1
Coast	10	4
<b>Total</b>	<b>14</b>	<b>5</b>
Number of places	10,890	4653
<b>Rural lodgings</b>		
<b>Category</b>		
Not categorized	86	4
<b>Location</b>		
Inland	82	4
Coast	4	0
<b>Total</b>	<b>86</b>	<b>4</b>
Number of beds	996	53

The analysis of data collected during the field work consisted of different stages. Principal component analysis was applied to data from the first section of the questionnaire (which included aspects such as level of education, age, geographic origin, and main reason for stay) and to four items from the third section:

- I turn off the tap when brushing my teeth.
- I turn off the shower when I am soaping.
- I distinguish between the small and large buttons when flushing the toilet (dual-flush system).

- I use shower water sparingly.

We chose these four questions because, unlike questions on towel and bed linen reuse, we considered they would be applicable to all hotels, rural lodgings, and campsites.

Respondents were asked to indicate how often they applied the four water-saving measures on a 5-point Likert scale, where 1 indicated never; 2, almost never; 3, sometimes; 4, nearly always; and 5, always.

Principal component analysis yielded a single factor, which, together with confirmation of internal consistency using Cronbach's alpha test ( $>0.7$ ), indicated homogeneous water-saving behavior by individual respondents. Using the ratings assigned to each item, we calculated a mean score (from 1 to 5) to reflect each guest's water-saving behavior during their stay.

The Kruskal-Wallis test [39] was used then to analyze associations between water-saving habits (mean scores from Section 3 of the questionnaire) and guest characteristics (age, sex, country of origin, choice of accommodation, location, and main reason for stay). This test is used to detect statistically significant differences between groups. Statistical significance was established at a  $p$ -value of less than 0.05.

We also analyzed answers to two yes/no questions from Section 3 of the questionnaire: (1) Would you be willing to reduce your water consumption in return for a discount on your stay or another incentive? and (2) Would you be willing to pay a supplement to be used by the establishment to improve its water-saving measures?

#### 4. Study Area

The Muga river basin is located in the extreme north-east of the Iberian Peninsula, on the border with France. It has 52 municipalities: 46 inland villages or towns, two coastal towns, and two inland cities. Each area attracts a different type of tourist. The coast attracts beach holidaymakers, the inland, more rural area, attracts nature lovers and visitors interested in outdoor pursuits, while the two cities, Figueres (the capital of the region) and La Jonquera (a border town), attract business travelers and urban/cultural tourists (Figure 1).

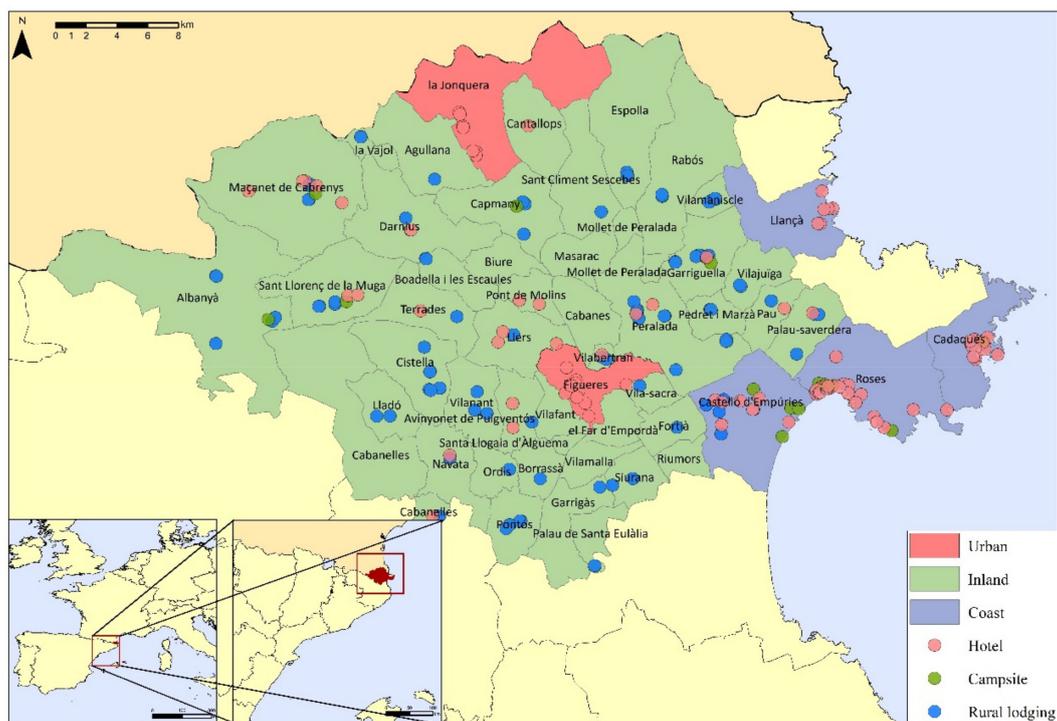


Figure 1. Location of tourist accommodation establishments in the Muga river basin by type.

The Muga river basin has 117 hotels, 86 rural lodgings, and 14 campsites, which together offer approximately 23,000 beds. The bulk of accommodation (80%) is located on the coast. Rural properties offer 15% of all beds, while city hotels offer 5%. The number of visitors has increased continuously since 2012, reversing a 4-year downturn caused by the economic crisis. According to official estimates based on data from tourist occupation surveys of hotels, campsites, and rural lodgings by the Spanish National Institute of Statistics (INE, Madrid, Spain), over 1 million overnight stays were recorded in the area for 2019 [40].

As mentioned, the Muga river basin is particularly vulnerable to water shortages as a result of climate change and rising demand from the tourist industry and other sectors of the local economy [1,2]. The main sources of water are the Darnius-Boadella reservoir and groundwater water extracted by wells. Figueres, the regional capital and home to the largest population in the area, in addition to several coastal towns are supplied directly by the Darnius-Boadella reservoir, while Peralada and Castelló d'Empúries have their own wells, which also supply other inland towns and villages. Demand for water from the reservoir has grown in recent years due to increasing groundwater nitrate pollution in many parts of the area. The response has been to create new connections to the reservoir to guarantee sufficient supplies of water fit for human consumption [41,42].

It is not surprising thus that conflicts between different sectors with competing interests have increased in both intensity and frequency in recent decades. Ventura, Ribas, and Saurí [43] reported 22 such episodes between 1980 and 1999, which corresponds to approximately one episode a year. In 1983, for example, the level of the Darnius-Boadella reservoir fell to just 25% of its total capacity, generating social alarm that led to an increase rather than a decrease in consumption due to fears of restrictions. The situation also generated additional tensions in 1998, when the level dropped to just 8.75% [43].

The main confrontations involving the tourist industry are with the agricultural sector and conservationist groups. Agricultural use accounts for approximately 70% of water use in the region [44], and water is required by law to maintain the river's environmental flows and conserve the coastal marshes in the Aiguamolls de l'Empordà Natural Park, which is an IUCN Category V (Gland, Switzerland) protected area and a member of the Ramsar International Network of Protected Wetland Sites. Tourism, however, has a greater social impact, as it is a key driver of economic growth and job creation. Conflicts between sectors vying for their share of water are more likely in times of scarcity. In 1984, for example, groundwater supplies to the tourist towns of Roses, Castelló d'Empúries, and Cadaqués, dropped dramatically, leading to what became known as the "water well war" [45]. The most recent conflict occurred in 2007 and 2008, sparked by the longest drought recorded in 70 years [46,47]. The Catalan Government took action by introducing a "drought decree" (April 17, 2007) to mitigate the effects of the fast-declining supply of water. The decree remained in force until early 2009 (January 13), when the last of Catalonia's inland river basins (precisely the Muga river basin) emerged from the state of emergency after more than a year without heavy rainfall at the headwaters of the river and with increasingly low reservoir levels and rising social alarm [48–50].

The Muga river basin remains vulnerable to the effects of climate change, and in a scenario marked by increasing demands and decreasing supplies, in part due to the effects of climate change in this area of the Mediterranean, new conflicts are likely to occur if appropriate water conservation and management measures are not taken by each and every one of the sectors that depend on this scarce resource.

## 5. Results

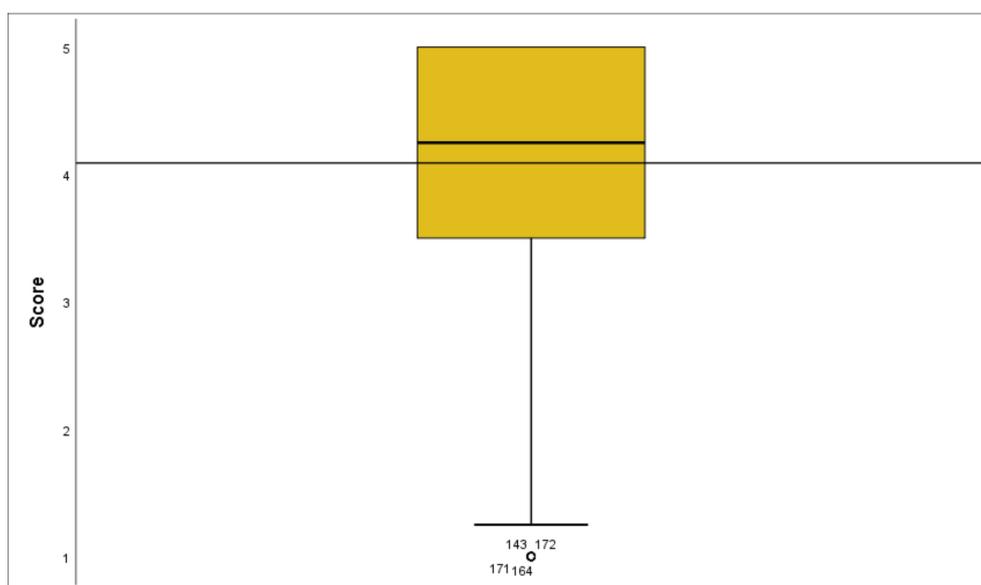
Of the 752 surveys conducted (Table 2) (726 of which were validated for this study), 53.6% were answered by women and 46.4% by men. The respondents were mostly aged between 26 and 40 years (35.4%) and 41 and 55 years (31%). A majority of respondents had a university education (38.6%), 22.9% had completed vocational training, 17.4% had attended secondary school, and 14.5% had completed upper secondary school education (preparation for university) (14.5%). Over half of the visitors were

from Europe (52.4%). French tourists were particularly common, which is to be expected given the proximity of the study area to France. The second largest group of visitors (22%) was from Barcelona city and metropolitan areas. Overall, 73.3% of tourists were from a Mediterranean country. The main reason mentioned for coming to the area was a beach holiday (47.1%), followed by nature tourism (27.7%) and urban/cultural tourism (10%). Less common reasons were sport (7.2%), business (2.4%), events (e.g., concerts, festivals) (2%) and youth and/or school tourism (1.7%). Campsites were chosen by 66.9% of tourists, hotels by 28.5%, and rural lodgings by 4.7%. The most popular area was the coast, which received 59.2% of all visitors, followed by inland areas (34.2%) and cities (6.6%).

**Table 2.** Main characteristics of guests at the tourist accommodation establishments surveyed.

		n	%
<b>Sex</b>	Male	349	46.4
	Female	403	53.6
<b>Age</b>	<25	95	12.6
	26–40	266	35.4
	41–55	233	31.0
	56–65	89	11.8
	>65	43	5.7
	Unknown	26	3.5
<b>Level of Education</b>	No schooling	6	0.8
	Primary education	39	5.2
	Secondary education	131	17.4
	Upper secondary education (university preparation)	109	14.5
	Vocational training	172	22.9
	University education	290	38.6
	Unknown	5	0.7
<b>Geographic Origin (I)</b>	Girona province	57	7.6
	Barcelona and surrounding metropolitan area	166	22.1
	Rest of Catalonia	54	7.2
	Rest of Spain	66	8.8
	Rest of Europe	394	52.4
	Rest of the world	15	2.0
<b>Geographic Origin (II)</b>	Mediterranean country	551	73.3
	Non-Mediterranean country	201	26.7
<b>Main Reason for Stay</b>	Business	18	2.4
	Sport	54	7.2
	Nature holiday	208	27.7
	Beach holiday	354	47.1
	Urban/cultural holiday	75	10.0
	Events	15	2.0
	Youth and/or school trip	13	1.7
	Unknown	15	2.0
<b>Type of Accommodation</b>	Hotel	214	28.5
	Campsite	503	66.9
	Rural lodging	35	4.7
<b>Location</b>	Coast	445	59.2
	Urban	50	6.6
	Inland	257	34.2

Principal component analysis of data showing the frequency with which guests engage in water-saving practices at the campsites, hotels, and rural lodgings analyzed showed a single component, indicating that individual ratings given to each of the four items on water habits were related. In other words, a guest who turns off the tap while brushing their teeth will also turn off the shower while soaping. Cronbach's alpha for internal consistency was 0.758, indicating that it was possible to calculate a mean score (1–5) for each respondent. The scores had the same significance as the scores on the Likert scale, where 1 corresponded to never (e.g., I never turn of the water while brushing my teeth) and 5 to always ("I always turn it off"). The distribution of scores is shown in Figure 2.



**Figure 2.** Frequency with which guests engage in water-saving habits on a scale of 1 (never) to 5 (always).

Approximately 75% of the respondents indicated that they always or nearly always turned off the tap while brushing their teeth or showering and that they used the dual-flush system and water sparingly in the shower with the same frequency. Just over half of the guests (55%) stated that they would be willing to pay a supplement to be invested by the establishment in water-saving measures and 73.2% said that they would be willing to reduce their water consumption in return for a discount or other incentive.

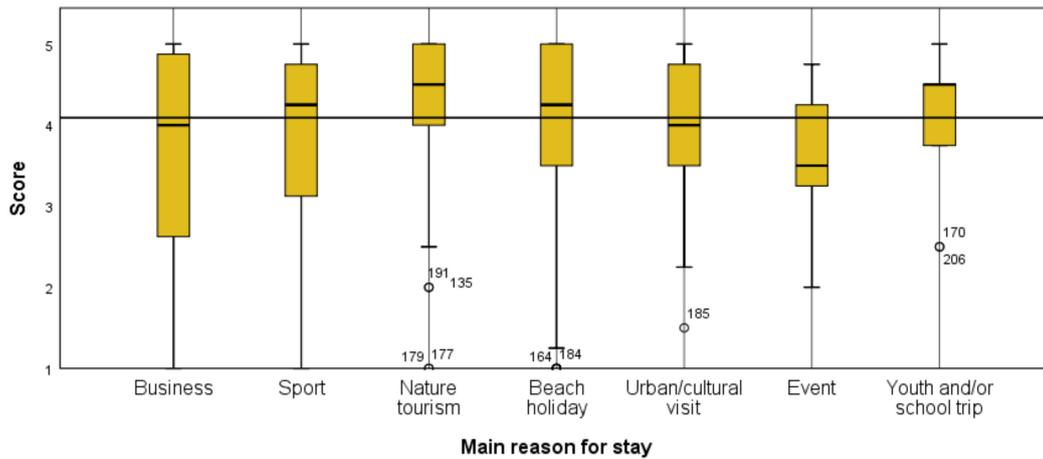
Despite these positive results, approximately one in four guests never, hardly ever, or only sometimes engaged in good water-saving practices during their stay. Understanding why can provide important information to guide strategies targeting guests with the worst water-saving habits.

### 5.1. Factors That Explain Good Water-Saving Practices

Analysis of the association between water-saving behavior and guest profile characteristics revealed significant differences between different types of guests. The Kruskal-Wallis test showed insignificant differences for sex, age, and level of education ( $p > 0.05$ ), but significant differences for main reason for stay, type of accommodation, and geographic origin. These factors are analyzed in the next section.

#### 5.1.1. Main Reason for Stay

Nature tourists were significantly more likely to frequently engage in good water practices than other types of tourists ( $p < 0.05$ ) (Figure 3). Visitors who had come to the area to attend an event had the worst water-saving habits.

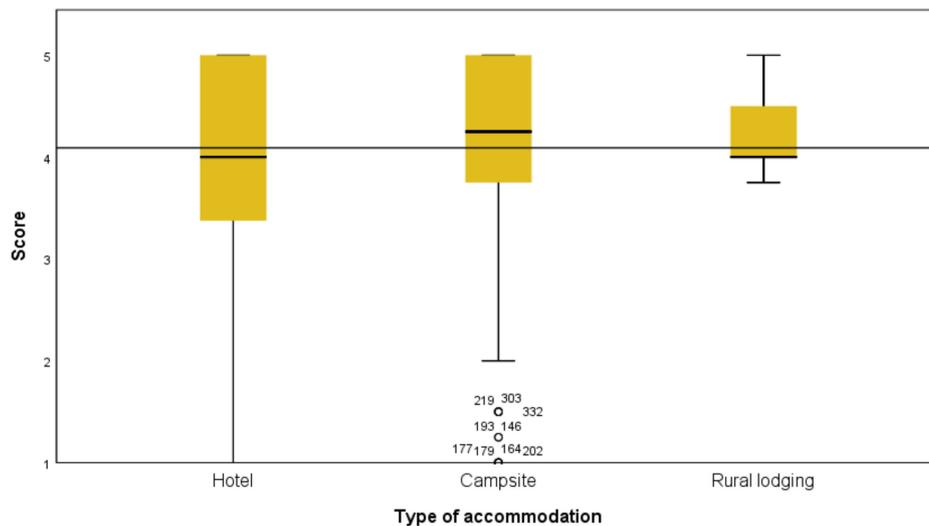


**Figure 3.** Frequency with which guests engage in water-saving practices by main reason for stay on a scale of 1 (never) to 5 (always).

Over 50% of nature, sport, beach, and youth tourists had above-average scores, while over 50% of business travelers and urban/cultural and event tourists had below-average scores. Nature tourists thus showed the greatest awareness of the importance of saving water while on holidays. Business travelers and cultural/urban tourists had the shortest stays and the worst water-saving habits. Almost 25% of business travelers scored lower than 3, indicating that they never or hardly ever engaged in good water-saving practices. This contrasts sharply with the data for nature tourists, 75% of whom always or nearly always engaged in good practices. Efforts to promote water-saving practices in this case should thus preferentially target business travelers, as well as urban/cultural and event tourists.

5.1.2. Type of Accommodation

Campsite and rural lodging guests generally had better water-saving habits than hotel guests (Figure 4). Sixty percent of campsite guests always or nearly always engaged in good water-saving practices. The mean scores by type of establishment were 4.23 for rural lodgings, 4.15 for campsites, and 3.93 for hotels. The behavior of rural lodging guests was highly consistent, with 100% of those surveyed scoring over 3.6. Behavior at hotels was more heterogeneous. Although half of the respondents scored higher than 4, approximately 30% scored 1 or 2.



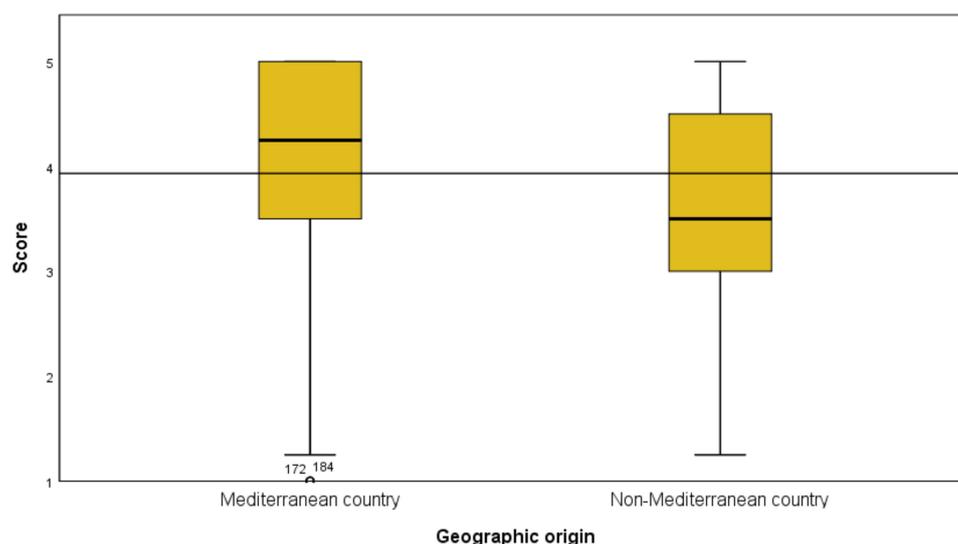
**Figure 4.** Frequency with which guests engage in water-saving practices by type of accommodation on a scale of 1 (never) to 5 (always).

The profiles of guests staying at campsites and rural lodgings were quite similar, with no significant differences observed for age or geographic origin ( $p > 0.05$ ). Nevertheless, campsite guests stayed for an average of 12.62 nights compared to just 3.56 nights for hotel guests. Number of overnight stays could thus be an interesting factor to explore in future studies, as campsites had the largest proportion of tourists with good water-saving practices.

### 5.1.3. Geographic Origin

Geographic origin was not significantly associated with water-saving habits in the overall sample, but it was a significant factor in the case of hotel guests ( $p < 0.05$ ).

Specifically, hotel guests from non-Mediterranean countries had worse water-saving habits than Mediterranean guests (Figure 5). Approximately 60% of non-Mediterranean guests scored 3 or lower, indicating that they never, hardly ever, or only sometimes engaged in good water-saving practices. In other words, just 40% of hotel guests from a non-Mediterranean country always or nearly always engaged in good practices, identifying thus a segment to target in good water practice campaigns.



**Figure 5.** Frequency with which guests engage in water-saving practices by geographic origin on a scale of 1 (never) to 5 (always).

## 6. Discussion

Surveying of tourists showed high rates of good water-saving practices at accommodation establishments while on holiday. In this case, in the study of water-saving practices by tourists visiting the Muga river basin in north-east Spain, 75% of hotel, campsite, and rural lodging guests reported that they always or nearly always engaged in good water-saving practices. This rate is higher than that reported by Weissenberg, Redington, and Kutyla [51] in the USA, where approximately 60% to 65% of travelers stated that they always or frequently engaged in good water-saving habits, although it should be noted that all those surveyed were business travelers staying at hotels. Despite the high proportion of tourists with good water-saving habits in our study, we were able to identify several factors that explained variations in behavior.

Interestingly, several sociodemographic factors that have been found to be significantly associated with good water-saving practices in previous studies, namely, sex, age, and level of education, were not significant in our study.

Diamantopoulos et al. [32], for example, found that women significantly more likely to engage in good environmental practices than men. Han et al. [19], in turn, found that women were more willing than men to pay extra to stay at a green hotel. In agreement with the findings of other studies, such as a

study predicting people's intentions to save water [52], we observed no significant differences between the water-saving practices of men and women.

Gabarda-Mallorquí et al. [29] found that water-saving practices varied according to level of education, with better practices observed in hotel guests with higher levels of education. They also found that older guests were more environmentally aware and willing to save water. Clark and Finley [53] also reported that older household members were more likely to use water sparingly, something they attributed to their having experienced water shortages in the past. Dimara, Manganari, and Skuras [20], by contrast, found quite the opposite in a study of towel reuse programs at hotels, with younger guests more willing to participate in these programs.

Reason for travel was a significant factor in our series, with nature tourists engaging most frequently in good water-saving practices than other types of tourists. This observation corroborates findings by Wang, Lin, Lu, and Lee [34], who reported that tourists who mentioned contact with nature as their main reason for travel tended to have a higher level of awareness about environmental problems, including water scarcity. In our series, good water-saving habits were least common in event tourists and business travelers, most of whom chose to stay at a hotel. This observation is in full agreement with findings by White and Hugues [54] for festival attendees in the United Kingdom.

We also observed better habits among hotel guests from Mediterranean countries. This could be because guests from countries with recurrent drought and similar water scarcity problems might be more environmentally aware and already employ good practices in their home country. As indicated by Gabarda-Mallorquí et al. [29], geographic origin should thus be taken into account when designing water-saving measures for tourist accommodation establishments. Dimara et al. [20], by contrast, in a survey of 1304 tourists in Greece, found that willingness to pay extra for towel reuse was not associated with geographic origin of the tourists surveyed.

## 7. Conclusions

Water-saving practices at different types of tourist accommodation establishments vary according to guest profile and variations can be explained by several sociodemographic and motivational factors. Reason for travel was one of the main factors that explained differences in water-saving practices while on holiday. Nature tourists were significantly more proactive when it came to using water sparingly than those traveling for other reasons, such as beach tourists, business travelers, and urban/cultural and event tourists. This observation suggests that tourists seeking contact with nature and interested in outdoor pursuits in the natural environment are more environmentally aware. Most of these tourists stayed at campsites or rural lodgings. Tourists with less contact with the outdoors (business travelers, cultural/urban tourists, and event tourists), by contrast, has the worst water-saving habits, and most of them were staying at hotels in the cities of Figueres and La Jonquera.

Similar behaviors were observed among campsite guests and among rural lodging guests, contrasting with the situation of hotel guests, whose behavior was more heterogeneous. Hotel guests from non-Mediterranean countries engaged less frequently in good water-saving practices than their Mediterranean counterparts. Living in a country with similar and possibly even worse drought and water shortage problems, which is the case of most countries in the Mediterranean basin, is thus likely to have a significant influence on awareness of the importance of water and proactivity in relation to the careful use of water while traveling.

Identification of a significant proportion of tourists who did not engage in good water-saving practices while visiting the Muga river basin confirms the need for urgent action to raise awareness and improve water-saving habits. Over half of the tourists surveyed stated they would even be willing to pay extra if this money was invested in water-saving measures at the establishment, and almost three-quarters said that they would be willing to reduce their water consumption in return for a discount or other incentive. In our opinion, incentives encouraging guests to use water sparingly should be implemented by tourist accommodation establishments as they have proven to be very effective in some hotels, including international chain hotels, such as Expo Astoria hotel in Lisbon

(a member of the Expogroup Company, Lisbon, Portugal) and numerous American hotels such as Starwood and Marriott [55]. In this second case, guests who reuse towels and bed linen or opt out of daily room cleaning receive a discount at the bar. Another strategy would be to reward guests with discounts on future stays, fulfilling thus two objectives: reduced water use and operating costs on the one hand and a greater likelihood of repeat and new bookings on the other.

Environmental awareness campaigns in the tourist accommodation industry should prioritize hotels, and signs or other information highlighting the problems of water shortages and encouraging careful water use in rooms should be mandatory. Hotels could also provide customers with information on the amount of water used at the end of their stay to encourage more efficient use. The installation of water sub-meters to monitor individual use could be used to offer discounts on stays or other services. Establishments should ensure that this information, alongside any other relevant programs, is clearly explained to guests on and before their arrival (e.g., on hotel websites and booking platforms).

Considering that tourists from outside the Mediterranean basin were the least likely to engage in water-saving practices and had the lowest levels of awareness, campaigns highlighting the need to use water sparingly while on holiday should target tourists in their countries of origin. Transit campaigns could also be effective. Leaflets explaining the problem of water shortages at the tourist's destination and stressing the need to use water carefully, for example, could be distributed on planes, trains, and ships. The Balearic Island Government launched a particularly interesting campaign at Palma de Mallorca Airport in the summer of 2019 that consisted of placing large transparent suitcases comparing water levels in the Balearic Islands and the tourists' country of origin on baggage reclaim belts as the tourists awaited their luggage [56]. The campaign caught the attention of many tourists, who, when interviewed afterwards, stated that they had been unaware of this problem and seemed agreeable to the idea of acting differently while on holiday to help safeguard the islands' water supplies. Campaigns of this type clearly lead to heightened awareness and ultimately encourage guests to use water more carefully when they arrive at their accommodation.

Finally, the results of this case study, together with findings from previous studies in the area, confirm the need to increase knowledge and awareness of the effects of climate change on water supply among both accommodation owners/managers and guests. They also highlight the importance of implementing mitigation and adaptation measures and ensuring that these efforts lead to a positive response by guests. For this to occur; however, coordinated action by all key stakeholders in the tourism industry, including owners, managers, guests, staff, and public bodies, is necessary.

Despite the above, it is likely that the negative economic consequences of the COVID-19 crisis will trigger a shift in priorities among hoteliers and other accommodation owners. It is important thus to continue to drive home the message of the importance of advancing towards sustainability and efficient water use and there is no reason steps in this direction cannot be included in general restructuring efforts. It is essential not to lose sight of the fact that solutions for combating major structural crises that affect the tourism industry and society as a whole are closely linked to efforts to combatting climate change and achieving a more sustainable use of natural resources.

## 8. Limitations

Our findings should be interpreted within the context of the time when our surveys were conducted (July to September, 2018). Since then, two major events have taken place. The first was an extratropical cyclone (Gloria) that wreaked havoc on the local economy and environment in January 2020 and the second is the COVID-19 pandemic, which has led to severe lockdown measures in Spain (starting on March 14, 2020), with a dramatic impact on the tourism industry. Future research should perhaps take account of these events to determine their potential influence on water-saving practices.

Although our sample was adequate for the general purpose of this study, our results may have been biased by overrepresentation of certain types of accommodation or reasons for stay. The number of participants staying at rural lodgings, for example, was lower than that of those staying at campsites or hotels, primarily because of the fewer guests and the difficulty of conducting on-the-spot interviews

at rural properties. It should also be noted that our surveys were conducted the peak tourist season (June to September). Targeting tourists at other times of the year could reveal different profiles of guests. Our sample did not include 5-star hotels, as the two hotels of this category in the Muga river basin declined our invitation to participate in the study.

A final limitation is that our results may have been influenced by social desirability bias. Because we conducted on-site interviews, there may be some discrepancy between what the tourists said they do and what they actually do. In other words, this lack of anonymity may have prompted more “politically correct” answers, with respondents exaggerating good habits [57,58]. Nevertheless, one clear advantage of on-the-spot interviews is that they have higher response rates and provide more opportunities to clarify doubts and therefore obtain more information than self-administered questionnaires [59].

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