

Article

Water Resource Management in Hotels Using a Sustainable Balanced Scorecard

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Abstract: It is essential to find a balance between tourism development and sustainable consumption of water resources. To achieve this goal, a Sustainable Balanced Scorecard connected to the Sustainable Development Goals (SDG) is proposed for optimal water resource management in the hotel sector. The Scorecard is based on four perspectives: customer, internal processes, learning and improvement, and financial. The key variables were agreed on with stakeholders in the sector, and the Sustainable Balanced Scorecard was tested empirically on a sample of 70 hotels in island tourism destinations in the Macaronesia region. The results revealed that though more and more hotels have tried to implement strategies to save water, they were still a long way from reaching the international standard of 140 L per guest night. In addition, there were significant differences concerning water consumption according to hotel category. The Sustainable Balanced Scorecard in this paper adds to the existing works about materiality in sustainability. It can also support business decision making about the SDGs and help potential investors.

Keywords: sustainability; balanced scorecard; Macaronesia; hotel sector; water resources; water resource management



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1. Introduction

The need to efficiently manage water resources has become increasingly important in global political planning in recent years. Evidence of this is that “guaranteeing water availability, its sustainable management and sanitation for all” is the 6th objective included in the 17 Sustainable Development Goals (SDGs) of universal application of the 2030 Agenda agreed by more than 150 heads of state and governments in 2015. Among the activities that have negative impacts on water resources, tourism is undoubtedly one of the most relevant [1]. However, it is also true that tourism development generates economic and social growth [2] and that the economic activity of many geographic regions is closely related to tourism [3].

Therefore, it is essential to find a balance between tourism development and the consumption of water to guarantee sustainability [4]. Finding this balance is even more important in island destinations because of the scarcity of land and other resources, such as water [5,6]. According to Tirado et al. [7], in island environments with major tourism activity, conflicts can arise around water use. The search for the right balance should focus not so much on efforts associated with increasing water production as on the implementation of optimal water management systems [8].

Most research in this area has focused on the analysis of direct water consumption in hotels. Nevertheless, according to Gössling [9], there are still important challenges to be solved. Among current research gaps, ref. [9] claimed that there was a need to propose indicators that facilitate the comprehensive management of water demand in tourism, and specifically in the hotel sector. However, little progress has been made on the design of management control tools using integrated indicators.

To help fill the above gap, this study designed a Sustainable Balanced Scorecard specially adapted to water management in the hotel sector. The aim of this management tool was to measure and characterise, both internally and externally, the effort made by hotel companies to achieve the SDGs, especially number 6, which is closely related to water. Likewise, communicating impacts on SDGs is gaining more and more importance and some authors, such as Lee and Vargas [10], have proposed the addition of an 18th goal, designated as “communication for all”.

This study also intended to further knowledge regarding Balanced Scorecards and water resource management in the hotel sector. In a review carried out by Hoque [11], 181 articles on Balanced Scorecards published between 1992 and 2012 were analysed, revealing that none of them referred to the hotel environment. Previously, Elbanna et al. [12] tried to fill this research gap by measuring the business performance of a sample of 175 hotels using a Balanced Scorecard. However, to the knowledge of the authors, this management tool has never been adapted to the specific case that was examined here.

Following this introduction, the issues of tourism and water resource management and the importance of the hotel sector in addressing this problem are analysed, and the identification of the variables that affect water resource management and highlighting of efficient management techniques implemented are reported. In the Section 3, the theoretical background of the Sustainable Balanced Scorecard is discussed. Next, the methodology by which this tool was applied to a sample of 70 hotels of the Macaronesia region is explained. The Section 5 focuses on the data collection process and precedes the presentation of the results. Finally, there are the discussion and conclusions, as well as indicators for future steps that must be undertaken regarding policies, both public and private, aimed at the efficient management of this increasingly scarce resource.

2. Hotel Sector, Water Resource Management, and Sustainability Reporting

Considering the necessity of efficient water resource management in tourism, the role of the hotel sector appears as a priority, since water consumption in the tourism sector is higher than that in the domestic sector: 300 L per day on holiday versus 160 L per day when at home [13].

Another aspect that should not be neglected is how tourism establishments communicate their actions to different stakeholders. In the field of sustainability, the consideration of what to report is linked to the concept of materiality, which can be summed up, as stated by Bernstein [14], as the criteria to define something as important and significant. Although the reporting of sustainable actions by hotels is a common practice, hotel managers are still evasive when disclosing their criteria about materiality [15]. These reports might relate to the obligation of providing nonfinancial information, which has been reinforced at EU level with “Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups”. Nonfinancial information has become increasingly important for assessing companies’ performance and in the decision-making process for investment [16]. Among the challenges to providing information that is not in the accounting books is the issue of the financial materiality of sustainable actions carried out by organisations. According to Schiehl and Kolahgar [17], the disclosure of environmental, social, and governance (ESG) information is relevant to potential investors.

Regarding the assessment of the financial materiality of water resource management, several tools can be mentioned. First, the Global Reporting Initiative (GRI) provides a series of indicators that could be applied to the hotel sector that include, among others, *total water withdrawal by source (G4-EN8)* and *percentage and total volume of water recycled and reused (G4-EN10)* [18]. Second, the Sustainability Accounting Standard Board (SASB) has developed accounting metrics specifically for the hotel and lodging sector, among which water management is mentioned, recognising that the impact of water consumption from tourism establishments “may be particularly acute in water-stressed region due to

supply constraints” [19] (p. 10). The metrics for measuring materiality focused on water withdrawal from different sources and water consumption.

Despite the existence of the above tools to address financial materiality in water resource management in hotels, there is a gap when it comes to the definition of proper indicators to evaluate such management in the hotel sector. In a literature review by Antonova et al. [20], only one article proposing new water management indicators was found [9]. The author divided them into direct and indirect water use. Direct use included water consumption by accommodation and activities, whereas indirect use arose from use by infrastructure, fossil fuels for transport, energy use at hotel, biofuels, food, and other consumption. The author also proposed eight indicators, such as renewable water resources per guest night in peak season, area of irrigated land per bed, area of pool per bed, energy use per guest night, kilograms of laundry used per guest night, and others.

The largest body of research on hotel water management has been devoted to examining water management systems and has mostly focused on their implementation as an important part of resource management and environmental programmes adopted by hotels (e.g., [21–23]). For island destinations, Charara et al. [24] concluded that, for the case of Barbados, the limited importance of water bills in annual expenses discouraged the introduction of water management policies.

Another group of articles has attempted to identify the determinants of water management and environmental programmes in the hotel sector. For example, Tirado et al. [7] tried to identify the main variables that drove the adoption of water-saving measures in hotels on the island of Mallorca, Spain. According to their results, hotels that were built in the early stages of tourism development did not consider water efficiency as a priority. However, hotels that had internal laundry facilities and were of a higher category were more willing to introduce more technologically advanced water-saving measures.

Another point of interest in this field is the study of hotel guests’ opinions about water management in tourist establishments, as well as guests’ profiles and behaviour. Thus, Gabarda-Mallorquí et al. [25] investigated guests’ profiles in a hotel that had best practices in water management in Lloret de Mar, Spain. The study revealed four guest profiles with different sociodemographic characteristics and different levels of awareness and proactivity in relation to water conservation, ranging from not aware and not proactive to aware and proactive. In addition, Morgan et al., Dimara et al., and Gössling et al. [26–28] researched guests’ perceptions of towel reuse programmes.

Several articles have analysed the qualitative and/or quantitative effects of the implementation of water-saving measures and the consequent effect of these on the hotel sector. For example, Gatt and Schranz [29] analysed the retrofitting of a three-star hotel in Malta, which included reductions in toilet-flushing volumes, replacement of aerators on taps, and replacement of showerheads with proprietary ones. These initiatives were shown to be economically profitable. According to Styles et al. [30], implementation of best practices in water management across hotels and campsites at the European level could reduce water use by 422 million m³ per year.

Articles on water management in the hotel sector have mainly characterised only existing systems of water management in hotels or the results of implementation of a specific water-saving measure without applying any methodology or indicators. The efficiency of water management has been measured in water savings (total water use or per guest night) or by considering the amount of investment.

To contribute to the issue of measuring the materiality of sustainable actions in companies and based on the literature review above, this article aimed to organise and compare the impact of the different measures adopted by organisations to efficiently manage their water resources. Therefore, a Sustainable Balanced Scorecard, with a specific focus on its relationship with the SDGs, is proposed using a sample of tourism accommodations.

Water Resource Management and Tourism in Macaronesia

Island destinations are especially sensitive to the increasing frequency of natural disasters [31]. In the long-term perspective, climate change leads international tourists to visit small islands rather than nonisland states [32], which puts additional pressure on correct resource management.

Because of the expected consequences of climate change, the impact on water resources is especially worrisome. For island destinations, the situation is aggravated “due to their geographical isolation and limited options for enhancing supply” [33] (p. 1). The forecasted effects exacerbate the threat for island systems [34] in a context of increasing water demand [35] combined with rainfall variations that will produce more situations of both water shortages and unexpected weather phenomena [36]. Among the water-related consequences of climate change on islands, Deyà Tortella et al. [37] pointed out a reduction in water quality and water supply that could not only directly affect the local population but jeopardise the tourism sector, which is generally associated with increased use of natural resources [38]. Despite the importance of the topic, Gonzalez Pérez et al. [39] identified several gaps in the current research into water resource management and island destinations, such as the scarce development of comparative analysis in the field and a lack of analysis of the extra cost that will be incurred to meet tourism water demands.

The sample of hotels used to propose the Sustainable Balance Scorecard was from the Macaronesia region, which has a series of geographical, environmental, and historical aspects that have given it its own biogeographic identity. Among these common factors, Vera Peña et al. [40] highlighted:

- High population density in relation to generally available resources;
- An important, established, or emerging tourism sector on some of the islands;
- An agricultural sector of relative economic importance;
- Fragility and exclusivity of ecosystems;
- Volcanic origin, which determines the complexity of the subsoil and the orography of the land;
- Closed and isolated systems of water management—transfers from rivers or lakes are not possible.

This region features both a water shortage and a high volume of tourists arriving annually in a fragmented territory, especially in the Canary Islands and the Madeira archipelagos [41]. The Sustainable Balanced Scorecard proposed herein was applied to a sample of hotels on Tenerife and Madeira, as those were the islands with the largest number of registered establishments on each of the archipelagos and as tourism is the main driving force of economic development, generation of employment, and territorial balance in both destinations. During 2019, a total of 6,110,838 tourists arrived in Tenerife, which was an increase of 5.3% on the previous year. About 66.6% of these tourists stayed in hotels, while 33.4% chose other accommodation establishments [42]. According to the Impactur Canarias 2018, tourism activity contributed 35% to the gross domestic product (GDP) of the Canary Islands, creating 343,899 jobs, 40.4% of the regional total [43].

In Madeira, the total number of tourists was 1,382,987 [44]. Tourist consumption in Madeira in relation to GDP was 26.6%; tourism also employed about 20,000 people, which accounted for 16.7% of the total employment in the region [45,46].

3. Sustainable Balanced Scorecard: A Tool for Sustainable Management in Organisations

To achieve optimal control in the management of any organisation, it is essential to incorporate a series of signs or indicators to identify possible deviations between estimated and actual results [47] and to guide companies’ decision-making processes [48]. With this objective, the Balanced Scorecard proposed by Kaplan and Norton [49] has emerged as a flexible strategic management tool [50,51] that allows control of all those measures that represent key variables to facilitate decision making and thus guides the correct implementation of a company’s strategy using financial and nonfinancial indicators [52,53].

In the traditional design of a Balanced Scorecard per Kaplan and Norton [49,54], four perspectives were proposed to guide business strategy: customer, internal processes, learning and improvement, and financial perspectives. Vega Falcón et al. [55] addressed the demand of many organisations to add other perspectives to broaden the strategic focus of companies in accordance with the requirements set by the SGDs. In this sense, the need to transition towards a Sustainable Balanced Scorecard that integrates social and environmental measures in the traditional structure of a Balanced Scorecard has been recognised [56–58]. Moreover, Martínez-Martínez et al. [59] indicated that environmental knowledge has a positive impact on business performance.

Along the same lines, Hsu and Liu [60] recommended a Balanced Scorecard structure for carrying out proactive management of the environmental strategy of an organisation. Regarding the water resource industry, Franceschini and Turina [61] developed performance dashboards for monitoring water and sewage companies operating in Piemonte, Italy. The authors defined common performance measurements that could help coordinate efforts among regulator bodies.

Connected with the tourism sector, Giannoukou and Beneki [62] proposed a Sustainable Balanced Scorecard specifically aimed at tourism companies that was divided into four main perspectives: institutional, economic, sociocultural, and environmental. Applying such an evaluation tool to the hotel sector could strengthen the framework to integrate stakeholders into sustainability reporting [63] and to determine key service quality elements to improve customer perspectives [64].

In general, three options to integrate social and environmental aspects in a Balanced Scorecard can be identified [15,65]:

- Integrate social and environmental aspects in each perspective;
- Add a new perspective that collects information on social and environmental variables;
- Design a specific social and environmental Balanced Scorecard.

In this work, the third option was chosen. This approach was recommended by [62] for companies that do not have an existing Balanced Scorecard yet wish to measure or integrate sustainability.

There is no doubt that given the specific characteristics of island destinations, sustainable water resource management has become a fundamental part of political strategies to guarantee a region's economic development in balance with its social and environmental development. Deyà-Tortella et al. [37] conducted a study that in part described climate change consequences on one of the most touristic island destinations of Spain, the Balearic Islands. These consequences included an increase in water-related problems and reductions in water quality, water supply, etc., thus affecting the sustainability of the destination and the quality of life of its population.

For this reason, the application of a Sustainable Balanced Scorecard designed for water resource management is especially relevant for this type of destination. This study concentrated on hotels located in Macaronesia, a territory made up of five archipelagos (Azores, Madeira, the Savage Islands, the Canary Islands, and Cape Verde), located in the North Atlantic next to Europe and North Africa. Of these five archipelagos, the study focused on islands with high numbers of tourists: Tenerife and Madeira [44,66].

4. Methodology: Designing a Sustainable Balanced Scorecard for Water Management in the Hotel Sector

To design a Sustainable Balanced Scorecard adapted to water management in hotels, the approach of the above four classical perspectives, customer, internal processes, learning and improvement, and financial, was maintained. According to Kaplan et al. [67], when developing a Balanced Scorecard, companies should establish key factors that can be translated into variables for each perspective and determine reference levels to make comparisons with an organisation's performance.

To identify these key variables and indicators, our proposal was based on a study by Nikolaou and Tsalis [56] using the methodology of the Global Reporting Index to introduce

environmental and social issues into the four perspectives of a Balanced Scorecard. The final selection of variables was discussed with different agents from the tourism sector in island destinations in a series of interviews to assess its relevance and usefulness in evaluating water management impact in the area. Specifically, a total of six qualitative interviews were conducted by the research team with hotel managers, hotel business associations, water management companies in hotel facilities, those responsible for public environmental programmes, and public administrations located in areas with substantial tourist activity. This study also went one step further and referred to the Reporting Guidelines of the GRI and United Nations Global Compact, which link business actions with their contribution to each of the SDGs.

To determine the association of key variables with the SDGs for each perspective of the Sustainable Balanced Scorecard, Goal 6 was reviewed first, and an initial list of connected variables and indicators was made. To complete the list, the search was expanded to other goals that could be linked to some of the perspectives.

The Table 1 shows the final selection of key variables, the indicators by which they were measured, the equivalent business themes, and available business disclosures according to the aforementioned document of reference.

Table 1. Relationships between key variables of the Sustainable Balance Scorecard and the SDGs.

Key Variable	Indicator	Target	Business Theme	Available Business Disclosure
Customer perspective				
Water consumption	Average water consumption per guest night (litres)	Target 6.4	Water consumption	Company water consumption (facility level); water consumption data for all facilities
Environmental certification	Existence of environmental certification	Target 6.4	Water management	Company water governance Companies with water policy
Awareness	Level of awareness of water-efficient measures among customers	Target 6.4	External impact management and communication	Education of customers to help them minimise product impacts
Internal processes perspective				
Water consumed from the municipal system	Volume of water consumed (m ³) per period from the municipal system	Target 6.4	Water withdrawal	Municipal water supplies or other public or private water utilities
Self-generated water	Volume of water consumed (m ³) per period from desalination systems, reuse, or own deposits	Target 6.3	Water withdrawal	Water withdrawal by source
Water-saving measures	Existence of adopted measures linked to water saving—can be divided by sections	Target 6.4	Water saving	Water-saving technologies and awareness campaigns
Learning and improvement perspective				
Incorporation of new technologies	Investment in new technologies to obtain higher performance, higher quality, and less negative impact	Target 6.4	Water saving	Water-saving technologies and awareness campaigns
Training and specialisation	Level of effort in training and specialisation of staff	Target 4.3	Employee training and education	Total estimated amount (USD) of costs incurred by the training provided to individuals as a result of the initiative
Research and development projects	Investment in R&D projects	Target 6.1	Water investment	Investment in water and sanitation with private participation

Table 1. Cont.

Key Variable	Indicator	Target	Business Theme	Available Business Disclosure
Financial perspective				
Investment	Amount of investment associated with the improvements made	Target 12.1	Not defined *	Investment in improvement of environmental performance and training programme in core business strategy
Cost savings	Cost savings linked to the implementation of water-saving measures	Target 12.5	Environmental expenditure	Environmental protection expenditure, including costs of waste disposal, emissions treatment, and remediation and costs of prevention and environmental management
Customers' loyalty	Percentage of repeat customers	Target 6.4	External impact management and communication	Description of company-wide water targets (quantitative) or goals (qualitative) and progress to date

* No business themes were defined for Target 12.1.

Most of the key variables identified can be useful for hotels to define their impact regarding SDG 6, mostly in regard to Target 6.4, which aims to increase water efficiency and ensure sustainable water use, but also in regard to Target 6.1, which refers to investment in water sanitation. Nevertheless, educational factors connected with Target 4.3 and aspects linked with SDG 12 (focused on sustainable consumption and production) also appeared. In this last case, investment was associated with Target 12.1, while reduction in water consumption fell into the scope of target 12.5. The business themes of *water savings*, *water withdrawal*, and *external impact management and communication* related to more than one key factor. Most of these themes could be allocated to internal processes, such as water savings and water investment, but there were also issues that could have external projections, such as external impact management and communication, which were associated with the potential awareness raised by the hotel regarding its actions.

5. Data Collection

Measurement Instrument and Characteristics of the Sample

To gather the necessary information to test the Sustainable Balanced Scorecard, a questionnaire was prepared requesting information about the key variables identified and their indicators. To send questionnaires, the authors counted on the collaboration of the Hotel Association of Tenerife, La Palma, La Gomera, and El Hierro (Ashotel) in Tenerife and the Tourism Project of the University of Madeira in Madeira. The questionnaire was open from September 2017 until May 2018 in Tenerife and from June to August 2019 in Madeira, with two reminders sent throughout both periods.

An email was sent to the 249 hotels that made up the total population (104 from Madeira and 145 from Tenerife) including a cover letter and a link to access the questionnaire. Of the 249 hotels, 28.1% (70 hotels) were interested in participating in the research and answered the 19-item questionnaire (44 hotels in Madeira and 26 hotels in Tenerife). In some cases, hotel managers sent the answers online, and in other cases, meetings were arranged to facilitate the data collection.

Regarding the structure of the questionnaire, about 30% of the questions were closed, and the rest had a short-answer format. The questionnaire's design was based on the literature on water consumption and water management focused on the hotel sector. A pretest for the questionnaire was run with several experts in the field, both academics and hoteliers, to ensure its comprehensiveness and validity. Following this, some adjustments were made, and the final version was sent by email.

The questionnaire, which can be found in Appendix A, was structured in three parts. The first included questions of a descriptive nature referring to the most recent year available (hotel property, number of beds, number of people employed, services available

in the hotel, area in square metres, surface area of green areas and golf courses, number of guest nights and occupancy levels). In the second part, specific information related to water consumption in the hotel was requested: water consumption in cubic metres, total consumption and by area, percentage of water that came from the municipal system, and percentage of water obtained with their own systems (reuse, desalination, and own deposits). The third part asked about measures and policies developed by the hotel related to environmental management, as well as motivational factors for implementing water-saving measures.

The main characteristics of the hotels can be seen in Table 2. The final sample included 70 hotels, 18.5% of which were five-star establishments, 55.7% of which were four-star, 20% of which were three-star hotels, and 2.9% of which each were two- and one-star hotels. The establishments in the sample had a capacity of 22,665 beds and a total of 5,535 employees. Occupation level in most cases exceeded 80% during the analysed period. Six types of services were identified: kitchen, laundry, swimming pool(s), spa(s) or similar facilities, and gardens and/or golf courses. On average, 20% of the total surface area was intended for green areas.

Table 2. Main characteristics of the sample.

Hotel Characteristics	1 Star	2 Stars	3 Stars	4 Stars	5 Stars	Total
Number of hotels	2	2	14	39	13	70
Number of beds	41	241	3706	12,571	6106	22,665
Number of employees	10	31	497	2983	2014	5535
Area (m ²)	1022	10,600	112,266	489,422	402,576	1,015,886
Number of guest nights	6802	57,101	915,406	3,585,371	1,369,148	5,933,828
Total annual water consumption (m ³)	2,219.00	23,240.00	328,124.00	1,065,890.18	757,239.00	2,176,712.18
Water consumption per guest night (litres)	326.23	407.00	358.45	297.29	553.07	366.83

To increase the credibility and validity of the data, 11 personal meetings with the management and technical staff of the hotel sector of Madeira and Tenerife were carried out, and in some hotels, the respondents filled out the questionnaire during the researchers' visit. Photographic and audio evidence was gathered from the visits, although some of the hoteliers preferred to keep the visit confidential and did not allow any photographs or recording of the interviews.

6. Results

The responses received were analysed in relation to the key variables identified for each of the perspectives described above. Since the data analysis did not require complicated statistical analysis, Microsoft Excel was used for the calculations and the preparation of figures and tables.

6.1. Customer Perspective

In relation to the first key indicator, water consumption per guest night, Figure 1 shows that water use per guest in hotels of Tenerife and Madeira increased as the hotels' star ratings increased. The effect of the number of stars of a hotel on water consumption has been analysed by many studies. In a study by Dinarès and Sauri [68], secondary data on annual water consumption showed that higher-category hotels consumed more water annually than lower-category hotels. The average consumption in the sample, 366.83 L per guest night, was far from achieving the internationally recommended level of 140 L [69] and showed a situation where water management could be improved.

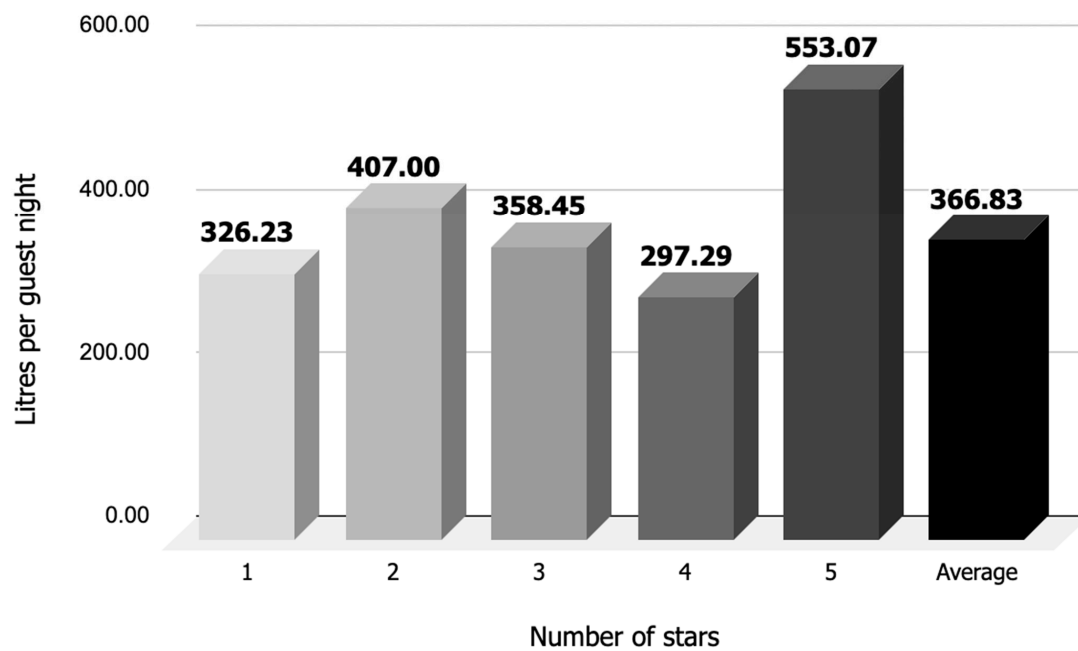


Figure 1. Water consumption per guest night in the hotel sector of the Macaronesia region according to hotel category (litres).

Regarding the second variable proposed, environmental certification, Figure 2 shows that higher category hotels applied for environmental certifications more frequently. In addition to environmental certification, a new item was added that was associated with the existence of environmental policies or programmes. This showed a similar trend, although the difference between the top and bottom categories was smaller. These results supported those of a study by Oreja Rodríguez and Armas Cruz [70], which recognised the remarkable effort made by hotel companies in island areas in terms of managing their environmental impacts. However, very few hotels included information on their environmental management policies in their marketing campaigns.

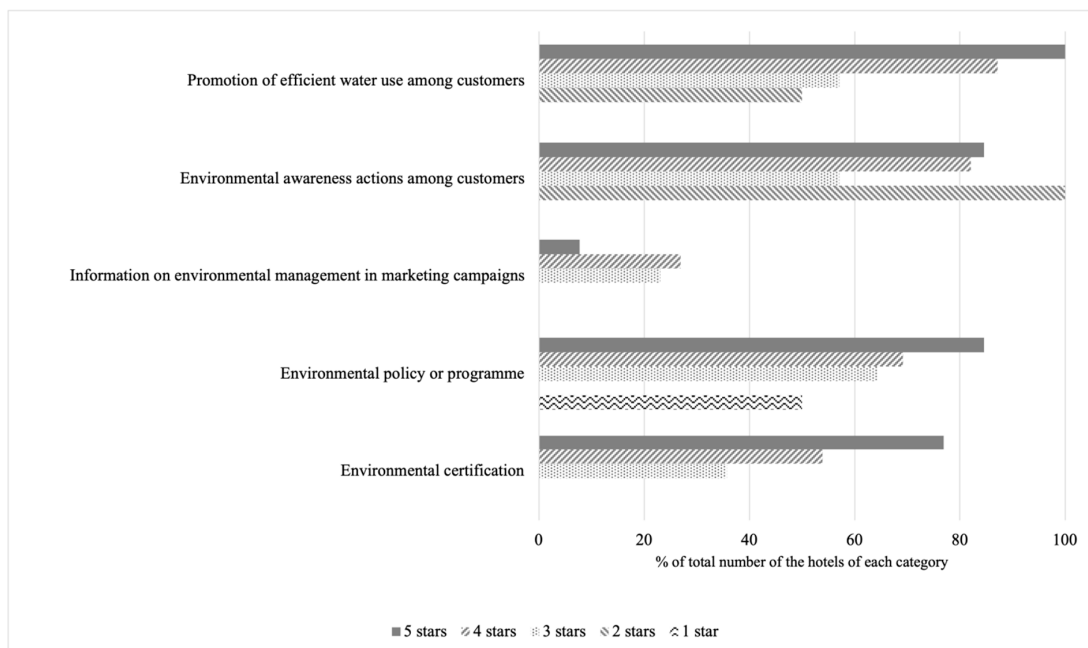


Figure 2. Water policies in the hotel sector of the Macaronesia region (% of hotels implementing them) according to hotel category.

Regarding the third key variable of the customer perspective, a question was included about the measures associated with environmental awareness carried out by the hotels surveyed. Although more than half of the three-star hotels stated that they carried out actions associated with environmental awareness among their customers, this number was more than 30 percentage points lower than in the case of four and five-star hotels, for which it reached over 80%. Among these measures, the specific ones associated with water resources were aimed at promoting efficient water use.

6.2. Internal Processes Perspective

In relation to the first and second key variables of this perspective, regarding water consumed from the municipal system and self-generated water, according to the survey responses, in most cases, 100% of the water consumed came from the municipal supply. One exception was a five-star hotel on Tenerife that had its own desalination plant, which supplied 56% of its total water consumption, while for the remaining 44%, it was connected to the public network.

An analysis of the third variable, installation of water-saving systems, is shown in Table 3. The most common measure was the installation of water-saving devices in tanks, showers, and taps, which were present in more than 90% of four and five-stars hotels. Contrarily to the general trend, which related higher category with more water management measures, actions involving water management devices were more frequent in three-star hotels than in four- and five-star ones. This could be due to the outsourcing of services such as laundry and cleaning, which are increasingly gaining a tactical nature [71].

Table 3. Water-saving measures in the hotel sector of the Macaronesia region (% of hotels implementing them).

Water-Saving Measures Implemented/Hotel Category	1 Star	2 Stars	3 Stars	4 Stars	5 Stars
Installation of water-saving systems in cisterns, showers, taps, etc.	0.00	50.00	78.57	94.87	92.31
Installation of water recycling systems for tanks	0.00	0.00	28.57	15.38	7.69
Wastewater reuse	0.00	0.00	7.14	5.13	23.08
Water-saving systems in garden irrigation	0.00	0.00	42.86	56.41	46.15
Devices with water-saving programmes	0.00	0.00	64.29	53.85	30.77
Devices with water consumption control systems	0.00	0.00	28.57	35.90	7.69
Devices with water recirculation systems	0.00	0.00	14.29	12.82	7.69
Use of plants that require little water and/or native vegetation	0.00	50.00	28.57	56.41	53.85
Use of rainwater	0.00	0.00	0.00	10.26	0.00

The percentages of implementation of the actions described coincides with the findings of Cobacho et al. and Subbiah et al. [72,73], who concluded that the most-used water-saving systems in the hotel sector were water consumption control devices in showers and taps, optimal discharge systems in bathrooms, and efficient washing machines. Regarding actions in hotel gardens, almost half of the three- and five-star hotels and most of the four-star ones had water-saving systems for garden irrigation. The second measure, implemented by more than 50% of four and five-star hotels, was the selection of garden plants that required little watering and/or native vegetation. On the contrary, only a small percentage of four-star hotels took advantage of rainwater.

6.3. Learning and Improvement Perspective

The hotels surveyed stated that water-saving measures were increasingly common in the hotel sector, and that water-saving programmes represented a competitive advantage that they realised required extra investment.

Moreover, most of the hotels surveyed in Tenerife (76%) and Madeira (almost 55%) considered that customers increasingly demanded actions linked to water saving in hotels, and more than 85% of the hotels in both territories believed that this generated a significant improvement in the hotel brand. However, it also produced some difficulties about incorporating new technologies that generate greater efficiency in water consumption, since actions to this end are very long-term, and it can be difficult for companies to quantify the investment made in an annual period. Hotels considered that they were quantitatively important investments. However, 70% of the hotels surveyed in Tenerife and 45% of those in Madeira stated that it was important that there were adequate incentives (subsidies, tax deductions) to promote the development of water-saving programmes. Additionally, 46% of the hotels in Tenerife and almost 30% of those in Madeira did not consider that adopting water-saving measures was hindered by the absence of professionals or companies with adequate training. Finally, almost 90% of hotels and 100% of four- and five-star hotels promoted water saving among their staff.

6.4. Financial Perspective

In relation to the indicators of this last perspective, more than 55% of the three- and five-star hotels surveyed affirmed that they quantified the cost savings associated with environmental measures, and 90% of the respondents perceived that the implementation of water-saving measures produced, over time, significant cost savings. However, only 16 of the 70 hotels were able to provide specific information, which was in some cases incomplete, associated with water consumption per service. Likewise, they did not quantify the investment linked to the measures put in place related to water management by independent means, nor did they quantify the number of customers that repeated their stays because of their perception of the hotel's sustainable management of water.

6.5. Proposed Sustainable Balanced Scorecard

To provide an overview of the findings, a Sustainable Balanced Scorecard summarising the results for the whole sample is proposed in Table 4. Although the previously mentioned problem of setting adequate levels for the indicators is still unresolved (since there are few reference values internationally accepted, and these could vary from destination to destination), this could be a good starting point for making comparisons for each individual hotel regarding the average of the region or those of the same category. It could also be useful to evaluate how the indicators change over time and, with further studies, how their performance compares against that of other regions.

The results showed that, from a customer perspective, the water consumption level was far from complying with the international standard of 140 L per guest night. The gap was higher than in previous studies, such as [9], where hotels moved in a range from 224 to 285 L per guest night depending on the category. Most of the hotels had environmental certification, and almost 75% of them promoted measures to raise awareness about water among customers. This was consistent with what Alonso and Ogle and Page et al. [74,75] observed regarding the preference of hotels for less sophisticated solutions. Internal process indicators presented a situation where a small number of hotels produced their own water resources, and most of them applied water-saving measures. The incorporation of technologies and the training of staff reached high levels in the sample, both exceeding 80%, which were much higher than the levels Torres-Bagur et al. [76] found in their study of hotels in Girona (Spain), where overall only 42.1% of the staff received specific training. From the financial perspective, there was still only a minority of hotels that effectively calculated cost savings linked to the implementation of measures, and none of them produced information on how improving water management increased customer loyalty.

Table 4. Sustainable Balanced Scorecard for the sample.

Key Variables	Indicator	Result
Customer perspective		
Water consumption	Average water consumption per guest night (litres)	366.83 L per guest night
Environmental certification	Existence of environmental certification	51.4% of hotels
Awareness	Level of awareness of water efficient measures among customers	72.9% of hotels
Internal processes perspective		
Water consumed from the municipal system	Volume of water consumed (m ³) per period from the municipal system	97.1% of hotels
Self-generated water	Volume of water consumed (m ³) per period from desalination systems, reuse, or own deposits	2.9% of hotels
Water-saving measures	Existence of adopted measures linked to water saving—can be divided by sections	85.7% of hotels
Learning and improvement perspective		
Incorporation of new technologies	Investment in new technologies to obtain higher performance, higher quality, and less negative impact	87.1% of hotels
Training and specialisation	Level of effort in training and specialisation of staff	84.3% of hotels
Research and development projects	Investment in R&D projects	N/A
Financial perspective		
Investment	Amount of investment associated with the improvements made	22.9% of hotels
Cost savings	Cost savings linked to the implementation of water-saving measures	48.6% of hotels
Customer loyalty	Percentage of repeat customers	N/A

7. Discussion

7.1. The Need for Clear and Reliable Indicators

The approval of the SDGs has started a race to provide indicators that can measure if companies, countries, and society are close to complying with them. However, the proposed parameters for this have been generally criticised for issues such as having little academic reflection in parameter choice [77], being distorted and weak [78], or not considering all the necessary elements [79].

Even though the SDGs are a reference, the challenge of measuring sustainability remains. It is necessary not only to advance in the development of sectorial indicators that connect with the general framework but to set standard levels to assess the impacts of actions by the different stakeholders involved. This should be done through more studies

that allow comparisons of organisations over different spaces and times. Without this, there is a risk of falling into greenwashing practices, which have dramatically increased in prevalence together with strategies of corporate environmental performance [80].

This study contributed to the development of a framework that helps strengthen some of the weaknesses of the indicators associated with the SDGs, such as their lack of visualisation [81] and the poor links between economic activity and the sustainability [82]. It also adds to existing efforts to improve the measurement of the financial materiality of sustainability, which has been explored by, among others, the GRI and the SASB. Some of the indicators proposed, such as water consumption and water consumed from the municipal system, were similar to those used in these metrics.

From an academic point of view, this study can provide support to further reinforce the linkage between business actions and SDG indicators that has already been started by international institutions. For island destinations, the definition of indicators to measure sustainability is especially important because of the scarcity of studies on the complex impact of their tourism sectors [83]. The current study can be connected to the methodologies already developed by Nesticó and Maselli [84] for the economic aspect, Graci and Van Vliet [85] for the perspective of stakeholders, and the sustainable visitation index (SVI) developed by Northcote [86] for the sustainability aspect. For hotels, it can serve not only for internal water management but for emphasising their sustainability achievements when informing their customers, which can influence customer satisfaction [87], and for informing how they value the management of scarce resources, as a study by Pietrucha-Urbanik and Rak [88] showed. Large platforms such as Booking.com are increasing their efforts to visualise the sustainable policies of hotels and have introduced the “environmental trip” category as a filter [89]. This shows the growing importance that customers give to knowing about sustainability before choosing their establishments.

7.2. The Challenges Ahead for the Hotel Sector

It is noteworthy that there was still an important difference between the volume of water consumed by tourists and the recommended 140 L per guest night [69]. This may partly be due to the limited promotion of water-saving measures within marketing strategies and the lack of specific information for each of the services that make up the hotel offer. Thus, it is proposed to design systems that provide information, both technical and economic, on different actions carried out in relation to water consumption. In this sense, and as a future line of research, cost-calculation systems such as the Activity-Based Costing system [90] should be added to these information requirements.

Improvement in sustainability reporting, which includes nonfinancial information, might have a positive impact on financial performance [91] and could be an important factor to diminish the negative image of the tourism and hotel sector as an extractive industry [92]. Improving the quality of indicators and the information offered to the public in the field of water consumption might help avoid issues such as *tourismphobia*, which is taking root in several destinations [93].

Moreover, in most cases, the people in charge of hotel companies need adequate financial incentives to respond to the need to commit to substantial investments when adapting infrastructures to new measures of efficient water management. In this sense, and as a result of this work, a comparative study of the costs of different systems for obtaining water for use by hotels, specifically desalination, reuse, and own water tanks, is proposed. This would allow measures to be quantified economically, which in turn would indubitably serve as a precedent for new actions.

8. Conclusions

In this study, a Sustainable Balanced Scorecard is proposed as a management tool to control different actions implemented by companies in water resource management, and the proposed tool was tested using a sample of hotels in the Macaronesia region. Following the four classical perspectives, customer, internal processes, learning and improvement,

and financial, the key success variables associated with each were identified, connecting them with the internationally recognised SDG framework. This was a first step to create a necessary framework for an especially sensitive topic, both because of the scarcity and importance of water and because of the role of the tourism sector in developing economic and social conditions.

The main objective of this paper was to provide a tool that could give an overview of the main aspects that influence efficient water management measures in hotels, support business decision making, and improve communication with stakeholders about impacts in regard to the SDGs. The proposed model revealed that, logically, most of the connections were established with Goal 6, but other goals were also involved.

The findings could help develop policies related to water-saving initiatives in tourism and make island destinations more resistant to changes in water availability. Additionally, they could encourage hotels to improve their assessment and communication of their contributions to sustainable development. Moreover, they might help improve hotels' reporting about sustainability by encouraging them to offer data that can influence the decisions of stakeholders, which, according to Eccles et al. [94], is one of the key determinants of materiality. This could be used to enrich the nonfinancial information that many hotels are now legally obliged to provide. To the authors' knowledge, this study was the first proposal for a Sustainable Balanced Scorecard in the field of water management in the hotel sector in island destinations. Therefore, some adjustments will probably have to be made in future research when more cases are analysed.

The need for more data is one of the clear limitations of the study, since hotels are not generally willing to share information about their internal management. In addition, the connection between business actions and their contribution to the achievement of the SDGs is still a work in progress, as a document of the Global Compact, United Nations, and GRI recognises [95]. Another limitation of this study was the necessity to enlarge the sample of hotels to establish comparisons with other destinations, especially on islands. To overcome this, future lines of research should focus on reaching a higher number of establishments, where improved communication about the benefits of the study could play a key role, and on enlarging the geographical scope of the research by also including hotels from other islands in the Macaronesia region.

There is no doubt that the estimated growth of the tourism sector in the coming years will complicate the achievement of more efficient use of resources in island destinations. Thus, the proposed Sustainable Balanced Scorecard could help identify the actions carried out by the hotel sector for better water use and their impacts, which would be key to designing destination strategies that improve sustainability. To do this, it is essential not only to emphasise the actions to be taken but to have greater knowledge of the consumption in each area of the hotel and make the necessary improvements.

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Appendix A. Questionnaire

Questionnaire: Control of water management in hotels using the Sustainable Balanced Scorecard.

First part: Questions of a descriptive nature.

1. Hotel property (whether the hotel is independent or belongs to a chain)
2. Number of beds
3. Hotel category
4. Number of employees
5. Services available in the hotel (kitchen, laundry, swimming pool, spa or similar facilities, gardens and/or golf courses)
6. Hotel surface in square metres
7. Surface of green areas
8. Guest nights
9. Occupation level (%)

Second part: Specific information related to water consumption in the hotel (annual).

1. Total water consumption (cubic metres)
2. Consumption of water in rooms (cubic metres)
3. Consumption of water in kitchen (cubic metres)
4. Consumption of water in swimming pools (cubic metres)
5. Consumption of water in spa or similar facilities (cubic metres)
6. Consumption of water in laundry (cubic metres)
7. Consumption of water in gardens (cubic metres)
8. Consumption of water in golf courses (cubic metres)

Third part: related to measures and policies developed by the hotel related to environmental management.

1. Please, choose from the following list the actions related to environmental management that your hotel has taken:
 - Environment certification(s)
 - Environmental policy or programme(s)
 - Including water-saving issues in marketing policy
 - Encouraging hotel employees to propose alternatives for saving resources
 - Environmental awareness actions among customers
 - Water-saving system/devices in taps, toilet flushes, shower heads, etc.
 - Water recycling for water from toilet flushes
 - System of sewage water treatment
 - Promoting water-saving measures among customers
 - Water-saving irrigation technologies/system in gardens
 - Washing machines, dishwashers, etc., with water-saving programmes
 - Water-efficient washing machines, dishwashers, etc. with control system for water consumption
 - Water-efficient washing machines, etc. with systems of water recycling
 - Selection for the gardens of plants requiring little water or/and native vegetation
 - System for collecting rainwater
 - Other measures: (please indicate which ones)
2. Please, indicate your level of agreement or disagreement with the following statements (definitely disagree, disagree, neither disagree nor agree, agree, definitely agree):
 - The adoption of water-saving measures is an increasingly common practice in the hotel sector.
 - The development of water-saving plans is a competitive advantage.
 - One of the main problems in implementing water-saving measures is the excessive investment needed.
 - Customers increasingly demand actions related to saving water in hotels.

- The implementation of water-saving measures represents a significant improvement in the hotel's brand image.
- The main reason to adopt water-saving measures is to comply with legislation.
- The absence of adequate incentives (subsidies, tax deductions . . .) is a major impediment for developing water-saving programmes.
- The adoption of water-saving measures in a hotel depends mostly on the awareness of the hotel's management.
- The implementation of water-saving measures in hotels is essential in areas of water scarcity.
- The implementation of water-saving measures means, over time, significant cost savings.
- One of the difficulties in adopting water-saving measures is the absence of professionals/companies with adequate training.

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