Addressing sustainable food management in hotels: proposing a framework and examining hotel groups

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Abstract

Purpose – Sustainable food practices have been recognised as a key issue in efforts to improve and report sustainable tourism practices, given the importance of the social, environmental and economic impacts of the food industry throughout its entire chain of production – from farm to fork. From this standpoint, the aim of the present paper is to propose a comprehensive framework for reporting or making decisions concerning sustainable food management in hotels, taking into account the various facets of the food supply chain.

Design/methodology/approach – Several dimensions are proposed for dealing with sustainable food management, involving all aspects of food supply chains that may be relevant for hotel decision-making. Furthermore, some key criteria for creating and using indicators of different types (qualitative and quantitative) to address these various dimensions of sustainable food management are suggested. Subsequently, the proposed framework is validated with the sustainability criteria and indicators provided by the top eight hotel groups, according to the 2019 SAM Annual Corporate Sustainability Assessment.

Findings – Hotels neglect a number of aspects of sustainable food management identified in the framework. The quality and the quantity of the information provided by hotels are limited.

Practical implications – There is a need to improve sustainability in food management in the hotels under analysis in several areas. A comprehensive framework such as that proposed in this paper may be of great value in seeking to remedy this situation. It may also assist users of hotel services and communities in making more informed decisions.

Originality/value – The proposed framework may be beneficial in advancing academic debate towards a more embracing and relevant understanding of sustainable food management in hotels and on the indicators required in this regard.

Keywords Sustainability indicators, Sustainable supply chain, Food chain management, Food waste, Hotels

Paper type Research paper

Introduction

Achieving environmental sustainability has become a crucial issue for all kinds of organisations in recent decades, as consumers' perceptions and motivations with regard to environmental issues affect their attitudes and intentions towards products and brands (Ek Styvén and Mariani, 2020; Choi and Johnson, 2019; Groening *et al.*, 2018). In the specific

domain of tourism, since the second half of the 1990s, the literature has increasingly recognised the importance of the environmental performance of economic actors concerning tourism management (Mariani *et al.*, 2016), and there is general recognition that sustainability can be a key factor in increasing competitiveness and competitive advantage (Buffa *et al.*, 2018; Mariani *et al.*, 2016; Boons and Lüdeke-Freund, 2013).

In the particular case of hotels, research has explored how environmental and green strategies are key methods of differentiation and for enhancing guests' experiences (Okumus, 2020; Koch *et al.*, 2020; Stylos *et al.*, 2018; Iraldo *et al.*, 2017). Hotels are under pressure from customers and other stakeholders to address environmental practices, and studies have demonstrated that introducing sustainability practices in hotel management increases customer satisfaction (Koch *et al.*, 2020; Iyer and Jarvis, 2019). In view of this, there is a growing interest in advancing the sustainability of supply chains in hotels, in order to deliver quality products and services while increasing efficiency and acting responsibly towards the environment and society (Al-Aomar and Hussain, 2019; Malik *et al.*, 2016).

More specifically, food management in hotels plays a crucial role in "creating competitive advantage, having environmentally conscious customers, reducing costs, minimising pressure, and increasing stakeholder satisfaction" (Okumus, 2020, p. 292). This is not surprising, given that food affects key areas of business strategy in hotels (Ettinger *et al.*, 2018). More broadly, sustainable supply chain management has been defined by Carter and Rogers (2008, p. 368) as *"the strategic, transparent integration and achievement of an organization's social, environmental and economic goals in the systematic coordination of key organizational business processes for improving the long-term economic performance of the individual company and its supply chains"*. It is undeniable that agrifood supply chains have major implications for sustainability in a number of social, environmental and economic aspects – from the fulfilment of human needs and the support of employment and economic prosperity to the tackling of poverty or reduction of global emissions of greenhouse gases (Gössling *et al.*, 2011).

In spite of this interest, it seems that the question of progressing towards more sustainable food management in hotels may be at a similar point as other aspects concerning the sustainability of the tourism and hotel sectors. The literature has demonstrated that there are a number of issues which may be inhibiting business from adopting more sustainable actions and policies (Agyeiwaah *et al.*, 2017). These range from the belief that adopting such measures will increase costs and therefore reduce competitiveness (Bramwell and Lane, 2012) to simple ignorance or neglect, or a lack of understanding of the topic of sustainability and how to address it (Khatter *et al.*, 2021), even when businesses are willing to do so (McKercher *et al.*, 2014). In this context, a key strategy to go beyond these limits and improve sustainable practices has been to find better ways to measure and communicate such practices. In so doing, consumers can more easily recognise them, value them and thereby increase their satisfaction (Koch *et al.*, 2020), and managers can make better decisions (Vejzagić *et al.*, 2018; Agyeiwaah *et al.*, 2017).

In order to advance in sustainability practices, there has been an effort to identify concepts, dimensions or criteria that can form the basis of a meaningful set of sustainable management indicators (Agyeiwaah *et al.*, 2017) or transformation success indicators (Fennell and Bowyer, 2020). As part of this effort to measure and communicate, recent studies have addressed, for example, the development of comprehensive and communicable indicators for various aspects of hotel administration such as energy, water management, building and waste management (Bagheri *et al.*, 2020). In the last few years, research in this field has been characterised, on the one hand, by attempts to adopt a comprehensive perspective, so indicators can measure all processes and operations related to sustainability (Stylos *et al.*, 2018) and, on the other hand, by attempts to propose indicators which are relevant for customer communication and for making better managerial decisions.

In this regard, the literature on sustainability indicators has also dealt with the issue of sustainable food management, based on various perspectives. By sustainable food management, we refer here to the systematic approach that seeks to reduce the environmental impact of food by considering the entire food supply chain, from the use of natural resources to manufacturing, sales and consumption, and ending with decisions on food recovery and final disposal (EPA, 2021).

In the dedicated literature on sustainable hotel management, on the one hand, some papers explore the concepts, dimensions and criteria for indicators regarding the issue of food as part of a wider framework of general indicators of sustainable management in hotels that includes food management, but not exclusively (Teng *et al.*, 2012; Sari and Suslu, 2018; Suárez-Cebador *et al.*, 2018; Agyeiwaah *et al.*, 2017; Zeppel, 2015; Ricaurte, 2011). However, as the structure of these proposals is extremely broad, they are too vague with regard to some dimensions and criteria and fail to embrace all aspects of food management. On the other hand, some other studies adopt a more focussed approach and explore concepts, dimensions, criteria and indicators for *specific* aspects of food management. The majority of these investigations focus on food waste (Okumus, 2020; Okumus *et al.*, 2020; Dhir *et al.*, 2020; Fennell and Bowyer, 2020; Kim *et al.*, 2019; Martin-Rios *et al.*, 2018; Papargyropoulou *et al.*, 2016; Betz *et al.*, 2015), but some studies focus on a variety of aspects, such as providing sustainable proposals (Hall *et al.*, 2013), working with green products and suppliers (Suárez-Cebador *et al.*, 2018) or focussing on the impact of the carbon footprint deriving from food (Gössling *et al.*, 2011). These studies are more detailed in the dimensions they address regarding some aspects of the food supply chain but do not cover all aspects of food management.

In view of the above, it has been recognised that the sustainable hotel management literature lacks a comprehensive framework which focusses on all aspects of management, encompasses all aspects of the food supply chain and which could be beneficial in communications with consumers and in managerial decision-making.

Some further studies beyond the literature on sustainable hotels also offer frameworks and indicators relevant for food management, such as general frameworks for analysing the sustainability of food supply chains (Allaoui *et al.*, 2018; Ioakuvu, 2015), or sustainable purchasing (Morales-Contreras *et al.*, 2019). All this literature provides highly relevant insights but reveals shortcomings when it comes to considering hotel management: Some proposals for general sustainable food management are too broad in character, only partially and very superficially dealing with food supply chains; other proposals focus on very specific aspects and do not embrace all the different elements of the food supply chain; finally, the literature that addresses sustainable food supply chains in general, or some particular aspects of them, does not offer a suitable framework that can be directly applied to the hotel industry. Nevertheless, some of this research can offer dimensions and criteria for developing specific indicators for sustainable food management in hotels.

Similarly, while the existing standards and certification schemes for hotels embrace several aspects, they do not fully consider all the specific elements of food supply chains. Moreover, it is unclear whether they are entirely relevant for hotels in terms of decision-making, transparency and communication. As Agyeiwaah *et al.* (2017) mention, the indicators available for hotels appear to be largely ineffective.

In light of this, there is still a lack – both in the scientific literature and in existing standards and certifications – of a consistent, relevant and comprehensive approach that can offer suitable criteria on indicators for sustainable food management in hotels. These indicators are necessary not only in order to measure business performance but also to inform, guide, inspire and communicate sustainable practices, thereby providing information to customers and facilitating the actions of hotels that are committed to making sustainable changes regarding their food management.

From this position, the aim of the paper is to propose and test the relevance of a comprehensive framework for different stakeholders to assess, report or make decisions regarding sustainable food management in hotels, considering the different aspects of the food supply chain. In answer to the issues raised in the literature (Allaoui *et al.*, 2018; Agyeiwaah *et al.*, 2017), we endeavour to propose a framework that is both relevant and specific, while also being flexible and adaptable.

To this end, the paper proceeds as follows: First, we create a framework drawing on the academic literature on green hotels and on sustainable food supply chains and management, and on international standards (GRI) and hotel green labels (Green Key and the Nordic Swan). We analyse concepts, topics and criteria for indicators from these sources in order to propose an original framework on two levels: First, we propose the aspects to address sustainable food management in hotels, considering the different dimensions of food supply chains that may be relevant for hotel decision-making; and second, we identify dimensions and criteria for building and using different types of indicators to address these various aspects of sustainable food management. As mentioned, some sources may offer us aspects that only partially concern the food supply chain in hotels, but they provide elements that can be connected together to build a more comprehensive framework.

Next, in order to test the relevance and potential of our framework for assessing and inspiring hotel practices, it is applied to eight international hotel groups. These are all global chains that claim to have an interest in consolidating their sustainability policies. The paper analyses reports and other available secondary sources produced by the hotels providing information on sustainability practices regarding food management. This information is analysed using the aspects, dimensions and criteria for indicators developed in the proposed framework to validate its applicability as a tool to assess sustainable food management in hotels. In this way, the framework is used to explore the empirical cases by asking the following question: *Which aspects of sustainable food management are considered and communicated by the hotels under study?*

As has been indicated, this question is relevant in a context in which hotel practices, measurement and communication regarding sustainable food management are very limited (Agyeiwaah *et al.*, 2017). It is also pertinent to the aim of our study, as it will help us to explore the relevance of the proposed framework for addressing this situation and improving practice and reporting.

This theoretical proposal and the empirical exploration of our framework on specific cases will serve to help us discuss the relevance, limits and potential of the framework for assessing and inspiring hotel practices regarding sustainable food management. What is more, it will also help us to explore some managerial implications by considering sustainable food management from a comprehensive perspective, one that encompasses all parts of the food supply chain under the control of hotel managers.

The paper is structured as follows: The second section draws on the aforementioned sources to build the framework; Method section explains how the framework is applied in order to explore the case of eight hotels; Results section presents the findings from the application of the framework in the selected hotels; and finally, Discussion section focusses on the managerial implications of our results and possible future avenues of research to refine our framework.

Theoretical framework

The literature on food chain management has emphasised that to understand the supply flow and address decisions (for example, regarding sustainability), it is essential to depart from the broad overview of the chain (Yürt, Mena and Stevens, 2010). The supply flow begins with agricultural inputs, connected with agriculture and fishing and then moves on to food and

drinks manufacturing through agricultural mechanics and packaging suppliers. From manufacturing, it moves on to retail and to final consumers, to catering and then to consumers or to wholesale and then catering and final consumers. In the whole chain, two key aspects are present: transportation, and waste and its disposal (Bloemhof and Soysal, 2017). This overview suggests that managing food implies addressing decisions in various aspects and considering different and sometimes conflicting factors regarding economic, social and environmental aspects (Betz *et al.*, 2015).

Considering this overview in the case of hotels, it can be said that they have direct impact on the aspect of wholesale (i.e. where and how a hotel procures the food served, including self-supply), catering (i.e. how the hotel processes food) and consumption (i.e. what the hotel encourages in terms of different consumption options). Nevertheless, they can also have direct impacts regarding the rest of the chain. In this way, this overall framework of the whole chain can be adapted to hotel food management. To this end, we draw on Gössling *et al.* (2011) as one of the few works on environmental sustainability that considers the whole food chain in food service providers in tourism. Gössling *et al.* (2011) identify three key aspects that correspond to the last part of the chain and which are under the direct control of the hotel: *purchasing* (corresponding to wholesale) *and self-supply* (using hotel urban gardens and other sources), *preparation* (corresponding to catering) and *offering* (corresponding to consumption). Beyond that, as the literature illustrates (Okumus *et al.*, 2020; Dhir *et al.*, 2020; Kim *et al.*, 2019), the question of food waste, defined as *"any food, and inedible parts of food, removed from the food supply chain to be recovered or disposed"* (FUSIONS, 2016, p. 13), is a cross-cutting issue which can be present in all these stages.

Concerning food waste management, the European Hospitality Industry (HOTREC) introduces a food waste hierarchy to help food service outlets handle food waste in a more sustainable way. The very first step is to prevent food from being wasted in the first place. Alternatively, food waste should be redirected to feed people and animals. The remaining part of food waste can then be recovered for composting or renewable energy generation. The least preferable step, which operations should try to avoid at best, is to fully dispose of food waste by sending it to landfill (European Hospitality Industry –HOTREC, 2017).

Beyond these specific aspects of the food chain, it is relevant to also introduce an overall aspect regarding food management, that is, the existence of an overall *policy*, with clear values, visions and objectives, regarding a triple bottom line perspective on sustainability; i.e. economic, environmental and social sustainability (Elkington, 2004). The elements defined can be found in Figure 1, in which we propose a scheme of the relevant aspects to be considered regarding food management in hotels, which will be used as the basis of our theoretical framework.

From this standpoint, we identify both in academic literature and in global standards the dimensions and criteria relevant for building food management indicators regarding these different aspects of the food chain. In this way, the framework structures the identification of dimensions and criteria under the aforementioned aspects of the food chain: *purchasing and self-supply*, *preparation*, *offering*, *waste* and *policy*.

Table 1 identifies some of the academic studies mentioned before. It includes those studies that provide specific dimensions and/or criteria regarding sustainable food management in different aspects of the food chain by hotels. Only aspects, dimensions and criteria directly connected with the food chain have been considered. As can be seen, we consider the two kinds of academic studies identified earlier. First, those directly addressing sustainability management in hotels: In this regard, we consider both studies proposing overall frameworks for addressing sustainability in hotels (as Suárez-Cebador *et al.*, 2018) and those focussing in specific aspects of food (as Okumus, 2020). Second, we draw on some works outside hotel management which may nevertheless offer relevant indicators for food management in hotels (as Betz *et al.*, 2015).
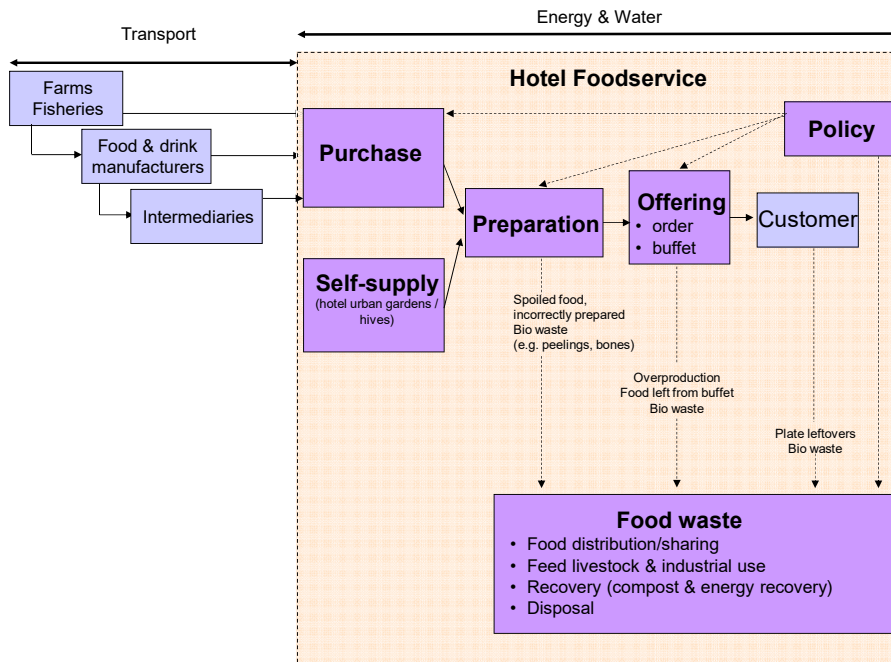
Transport

Energy & Water

Farms
Fisheries

Food & drink
manufacturers

Intermediaries

Hotel Foodservice

Purchase

Self-supply
(hotel urban gardens /
hives)

Preparation

Offering
• order
• buffet

Policy

Customer

Spoiled food,
incorrectly prepared
Bio waste
(e.g. peelings, bones)

Overproduction
Food left from buffet
Bio waste

Plate leftovers
Bio waste

Food waste
• Food distribution/sharing
• Feed livestock & industrial use
• Recovery (compost & energy recovery)
• Disposal

Figure 1.
Relevant aspects of the
sustainable
management of hotel
food chain

Source(s): Authors' proposal

Table 2 gathers the specific topics and indicators found in key global labels and standards that are relevant for proposing a comprehensive framework for food management in hotels. As with the academic literature, only dimensions and criteria regarding the food chain or closely connected with the food chain have been considered.

With the above information, we propose our own overall framework of dimensions and criteria for the different aspects of the food chain following these steps:

(1) All criteria identified in the literature and in labels and standards have been reviewed in detail after the initial selection. Those which were too general or not applicable to hotels were eliminated.

(2) Some criteria were left as they were found in the source. Some have been slightly changed in order to simplify them and to enable a more homogeneous formulation of the whole package of criteria.

(3) Similar criteria were merged, reformulating the new criteria by merging two or more previous ones when necessary.

(4) These criteria were organised regarding the different aspects of the food chain considered in our framework that were presented and justified above: *purchasing and/or self-supply*, *preparation*, *offering*, *waste* and *policy*.

(5) Once organised in the different aspects, the criteria were clustered in order to inductively identify dimensions of the aspect which encompassed similar criteria.

Authors	Topics regarding sustainable management of the food chain by hotel	Method	Industry and geographical scope	Criteria for indicators
(1) Betz *et al.* (2015)	Reduce Reuse Recycle Ecological products Green and/or socially responsible suppliers	Qualitative data from interviews with the chefs and staff	Foodservice industry in Switzerland	17
(2) Dirh *et al.* (2020)	Waste	Literature review	Food waste in the hospitality and food services	29
(3) Filimonau and De Coteau (2019)	Waste (pre-kitchen, kitchen and post-kitchen operation)	Literature review	Food waste management in hospitality operations	5
(4) Gössling *et al.* (2011)	Purchasing Preparation Offering	Literature review	Food management of foodservice providers in tourism	30
(5) Martin-Rios *et al.* (2018)	Collection Sorting Storage Transport Disposal In front-office, kitchen and disposal	Qualitative data from semi-structured interviews	Food waste in hotels in Switzerland	13
(6) Okumus (2020)	Waste (related with the whole food chain, from menu planning to post consumption)	Literature review and semi-structured interviews hotel employees	Hotels in Florida (USA)	32
(7) Papargyropoulou *et al.* (2014)	Raw food supplies Food storage Preparation and cooking Consumption Food waste disposal	Mixed methods (ethnography, and tools from industrial ecology for quantitative data analysis)	Food waste in hospitality in Malaysia	11
(8) Suárez–Cebador *et al.* (2018)	Reduce, reuse and recycle waste Ecological products Green suppliers	Questionnaires to managers	Hotel practices in South Portugal and Spain	4
(9) Teng *et al.* (2012)	Commitment Purchasing Waste (related with food chain)	Qualitative data from semi-structured interviews and expert panels	Carbon reduction indicators for hotels in Taiwan	4

Table 1.
Academic contributions on sustainable management of the hotel food chain

Table 3 shows our framework, considering the relevant aspects of food chain, dimensions, criteria and sources. The source refers to the sources of information provided in the first column of Tables 1 and 2. Figure 2 summarises this framework.

Method
The present paper is based on the descriptive analysis of secondary sources of information on eight hotel groups with a presence in several countries. The description of the practices

implemented by these top companies in the hospitality industry may contribute to the development of theory in this field, as suggested by Snow and Thomas (1994). This approach is also aligned with Woodside *et al.* (2012) who argue that the suitability of case studies for understanding management practices and highlight the benefits of this perspective in relation to positivist research.

We have focussed our study on the top eight hotel groups, according to the 2019 Annual Corporate Sustainability Assessment (SAM Corporate Sustainability Assessment, 2019). They are all actively involved in internationalisation processes that may have led them to pay special attention to the level and quality of reporting (in the line of Kolk *et al.*, 2001), thus including sustainability issues. The profile of the eight hotel groups selected for the present study is exhibited in Table 4.

Data were gathered from secondary sources of information, mainly available on the hotels' corporate websites (i.e. annual reports, sustainability reports, press releases and other website contents) available for each hotel chain in the moment of performing the analyses. A content analysis following an inductive approach was conducted by the four researchers of the team. The contents of the different sources of information were manually and independently coded by each researcher whenever there was evidence of a practice included in the dimensions and criteria under the aforementioned aspects of the food chain (see Figure 1) of the framework gathered in Table 3; i.e. purchasing and self-supply, preparation, offering, waste and policy. Subsequently, the inclusion of each piece of evidence found in the available sources of information in each coded category was assessed and agreed by consensus on the part of the research team members, after resolving issues and disagreements, as in previous studies in this field that focus on developing a theoretical framework (e.g. Dhir *et al.*, 2020). For instance, "presentation" was finally included in "offering", since it is related to the way food looks when served to the customer (e.g. portion sizes, plate size, use of pictures to support customer decisions).

The analysis of the evidence of the dimensions and criteria obtained from the process described above in the selected cases, which may be considered as a benchmark for other hotel groups, allows us to infer a series of indicators of sustainable management of the hotel food chain. In this way, we adopt an exploratory approach, thereby examining the scope and interest of our framework, as well as discussing its implications.

Results
Upon examination of the selected hotel websites, annual report chapters related to sustainability, independent sustainability reports and other information disclosed, we find evidence of the efforts made by these hotels to report their strategies and policies regarding sustainable management of the hotel food chain and to provide evidence of sustainability

Scheme	Topics	Criteria for indicators
(10) Green Key (2020)	Environmental management Food and beverage Waste	26
(11) GRI (2020)	Values, principles, standards and norms of behaviour Suppliers Waste	65
(12) Nordic Swan (2020)	Serving food and drink Transport Procedures Food	18

Table 2.
Indicators on sustainable management of the hotel food chain

Aspects of food chain	Dimension	Criteria for indicator	Source*
Policy	Pol1. Stakeholders	Pol1.1. Identification of food chain stakeholders' expectations and interests	11
	Pol2. Values, principles and standards	Pol2.1. Description of the organisation's values, principles, standards and norms of behaviour regarding food	11
		Pol2.2. Public statements of managers or decision makers about the relevance of food sustainability	11
		Pol2.3. Objectives and annual plans regarding sustainable food management	7, 11
	Pol3. Instructions	Pol3.1. Commitment, clear instructions and training for staff on sustainable food management	7, 2, 6
	Pol4. Innovation	Pol4.1. Invest in technological innovation to reduce waste	3
Purchasing	Pur1. Product origin	Pur1.1. Purchase of local food	4, 10, 11, 12
		Pur1.2. Purchase of seasonal food	4, 10
		Pur1.3. Purchase of fair trade beverage and food	10, 11, 12
		Pur1.4. Use of ecological and organically produced food	8, 9
		Pur1.5. Purchase of food involving air transport	4
		Pur1.6. Purchase of imported food	4, 9
		Pur1.7. Purchase of food involving vegetables grown in greenhouses	4
		Pur1.8. Ban on the use of food containing GMOs	9
		Pur1.9. Offering tap water	10, 12
	Pur2. Suppliers	Pur2.1. Identification of the positive and negative sustainability impacts of suppliers	11, 12
		Pur2.2. Working with sustainable suppliers	8, 11, 12
		Pur2.3. Informing suppliers about sustainability commitments and encouraging them to follow sustainability criteria	10
		Pur2.4. Involvement of supplier in reduction of waste	2, 5
	Pur3. Quantities	Pur3.1. Adaptation of quantities purchased to needs	7
	Pur4. Packaging	Pur4.1. Avoidance of single use packaging and purchasing overly overpacked products	4
Self-supply	Self1. Self-supply	Self1. Hotel self-sufficient urban gardens	–
Preparation	Prep1. Storage	Prep1.1. Optimisation of storage management (e.g. application of first-in-first-out principle and periodic control of date of expiry, temperature)	1, 2
		Prep1.2. Enhancement of order interval and no stock buying	1
	Prep2. Selection of food to be prepared	Prep2.1. Direct use of food near date of expiry (flexible meal planning)	1
		Prep2.2. Long-term analysis of meals sold in order to adapt food orders (with regard to weekday, season, holidays or major events)	1, 2
	Prep3. Cooking	Prep3.1. Use of renewable energy	4
		Prep3.2. Use of energy-efficient cooking	4
		Prep3.3. Outsourcing energy-intensive food preparation in-house	4
		Prep3.4. Prepare meals only after order	4
		Prep3.5. Waste sorting while cooking	9

Table 3.
Framework proposal for sustainable management of the hotel food chain

(*continued*)

Aspects of food chain	Dimension	Criteria for indicator	Source*
Offering	Off1. Interaction with clients	Prep3.6. Using same ingredients in multiple recipes	6
		Off1.1. Sensitisation of customers to the field of food waste and the causes of food waste	1, 6, 2, 3
		Off1.2. Recommend less carbon intensive dishes (in general, more vegetable and less meat menus)	2, 10, 11, 6, 2, 3
		Off1.3. Increasing tolerance of customers towards sustainability measures through communication	1
		Off1.4. Survey of reasons for plate waste using feedback sheets (and subsequent implementation of appropriate actions)	1, 6
	Off2. Type of food offered	Off2.1. Quantity of high impact food offered: beef, deep-sea-fish, farm fish	4, 10, 12
		Off2.2. Quantity of low impact food offered: potatoes, grain, chicken	4, 12
		Off2.3. Quantity of questionable species offered	4, 12
		Off2.4. Existence of attractive vegetarian offer	4, 12
		Off2.5. Existence of fast food	11
	Off3. Organisation and presentation	Off3.1. Adaption of portion and plate sizes to customer needs (supply of half portions and second helpings)	1, 4,12, 2
		Off3.2. Organisation of buffets so less carbon-intensive foods are at the centre	4
		Off3.3. Reduce portion sizes at buffets with more regular replenishment	12
		Off3.4. Use of small serving bowls at the buffet (filling as needed)	1
		Off3.5. No meals for presentation purposes only (use of photographs)	1
Waste	Was1. Control	Was1.1. Existence of control of production losses and its origins	1, 5, 6, 10
	Was2. Waste disposal quantity and methods	Was2.1. Total weigh of waste	5, 10, 12, 2
		Was2.2. Separation of food waste per national legislation, but with a minimum of three categories	10
		Was2.3. Disposal methods used	5, 10, 11
		Was2.4. Total weight of non-hazardous waste, with a breakdown by disposal method	5, 10,11
		Was2.5. Adequate management of waste, by local or national waste management facilities, private entities or the hotel	10, 6
	Was3. Conservation	Was3.1. Strategies for managing overproduction of food cooked and not used (e.g. freezing)	7
		Was3.2. Fast cooling down of food (to avoid microorganisms and thus waste)	1
	Was4. Reuse	Was4.1. Disposable items for take away (eco-labelled if possible)	6, 12
		Was4.2. Possible donation of food to local charities	1, 6
		Was4.3. Deliver remaining food from buffet or other to a cafeteria	6
		Was4.4. Other ways of reuse of leftovers	1, 3, 5, 6

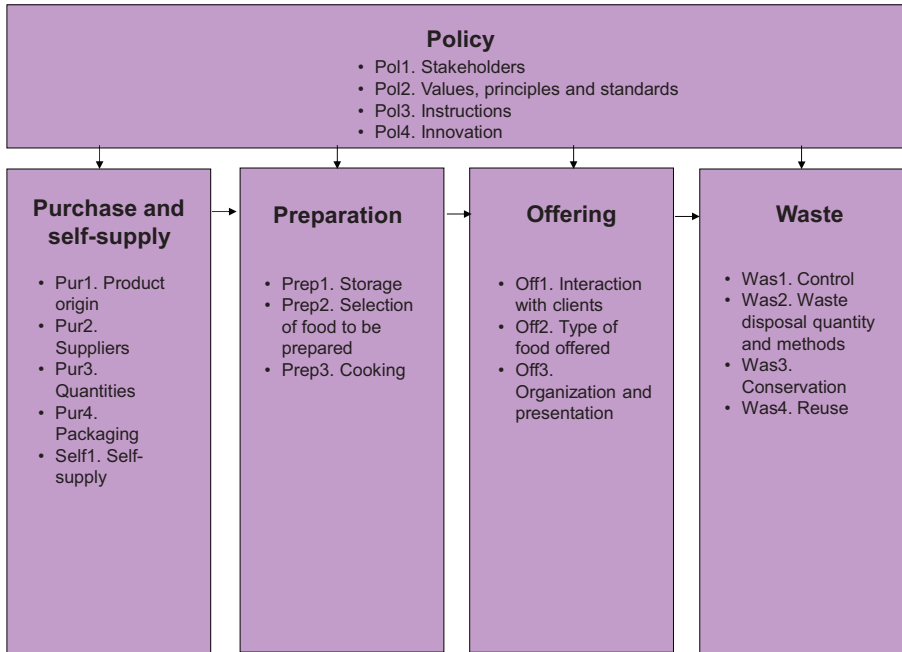**Source(s):** *As stated in the first columns of Tables 1 and 2

Table 3.

Source(s): Authors' proposal

Ranking	Company	Country	S&P Global ESG Score	#Hotels	#Hotel brands	#Countries	#Continents
1	Meliá Hotels International SA	Spain	83	325	7	34	4
2	Hilton Worldwide Holdings Inc	USA	79	6,100	18	118	4
3	InterContinental Hotels Group PLC (IHG)	UK	77	5,918	14	100+	4
4	NH Hotel Group	Spain	71	350	3	28	2
5	Marriott International Inc/ MD	USA	58	7,000+	30	131	3
6	Accor SA	France	48	5,142	39	110	5
7	Hyatt	USA	20	900+	18	65	4
8	Wyndham Hotels & Resorts	USA	18	8,564	20	80	5

Source(s): Authors' proposal from SAM Corporate Sustainability Assessment (2019) and hotel groups corporate websites

indicators or their activity. This finding is in line with previous evidence on the relationship between firm size and sustainability reporting and report assurance (Simnett *et al.*, 2009; Sierra *et al.*, 2013).

However, the visibility of the sustainability initiatives on hotel websites and the level of detail of these reports seem highly variable in content and format, so that comparisons between hotel groups are not straightforward. The level of detail of the information available seems to depend on the firm size or the international presence of the company. The proposed framework is used to register the evidence provided by each hotel group regarding their criteria and indicators to assess sustainable management of the hotel food chain (Table 5).

From Table 5, it can be inferred that some criteria are commonly taken into consideration by the hotel groups when reporting the sustainability of the food chain operations. In this sense, all hotel group examined stated that they work with sustainable suppliers. Notwithstanding, the indicators provided (e.g. percentage of sustainable suppliers, percentage of sustainable food procured, number of hotels in the group complying with this goal) differ greatly between hotel groups, and in some cases, no quantitative data are disclosed.

In the same vein, several hotels report having implemented composting programmes, but those who provide quantitative evidence differ in their indicators (i.e. number of hotels implementing composting programmes, food waste composted per occupied room in kg).

Common practices, such as removing or reducing the use of plastic straws, are reported by all hotel groups, but not all of them provide indicators of the plastic reduction in terms of the number of units reduced. In contrast, other initiatives oriented toward the reduction of the use of plastic beyond plastic straws are proposed by Marriott hotels. At two hotels, Marriott piloted Vivreau, an on-site bottled water system that reduces the need for and subsequent waste from plastic water bottles. The JW Marriott Phuket Resort & Spa installed a Generation Water system on-site that draws potable water from the humidity in the air. This system also reduces the need for bottled water on the premises. In 2019, the system replaced over 2 million plastic bottles (Corporate Traveller, 2020). However, the scope of these projects is rather limited, since only a few hotels in the group are involved.

Similarly, donation seems to depend on the existence of a network of charities or the extant legislation, and the monetisation of food surplus seems to depend on the availability of the app Too Good To Go in the community where the hotel is located. Therefore, the scope of some initiatives is regional or even local. This is the case of the participation of Meliá hotels in Circular Hotels, a public–private alliance supported in the Balearic Islands (Spain) to promote transition by the hotel industry towards a circular economy model involving better waste management and reintegration into the economic cycle, thus minimising the environmental impact of waste. Another example is the case of all four Alila Bali hotels (Hyatt) that achieved their goal of zero waste to landfill by approaching waste in an innovative way, including an on-site laboratory where all waste streams are transformed into higher value products and services.

Several hotel groups state having implemented or having progressed in the implementation of control of production losses and its origins, but they seem to differ in the level of development of these control mechanisms and their integration with other internal information systems available in the company.

From Table 5, it can also be inferred that despite excelling in sustainability reporting and having implemented their own sustainability programmes or schemes (e.g. LightStay platform to measure, manage and report all of Hilton's environmental and social performance metrics; Marriott Environmental Sustainability Hub [MESH], Wyndham Green Certification scheme), these eight hotel groups greatly differ in the importance paid to the food chain in their organisations when setting their sustainability goals and reporting sustainability

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Criteria for indicator	Meliá	Hilton	IHG	NH	Marriott	Accor	Hyatt	Wyndham
Pol1.1. Identification of food chain stakeholders' expectations and interests	X	X	X	X	X	X	X	X
Pol2.1. Description of the organisation's values, principles, standards and norms of behaviour regarding food						"Let's nurture the appetite for a healthy, sustainable, waste-free diet" Commitment to avoid food waste	"Food, thoughtfully sourced, carefully served" Hotel Kitchen Toolkit (2020) developed in cooperation with other organisations X	
Pol2.2. Public statements of managers or decision makers about the relevance of food sustainability						"We feed our guests like we would feed our own kids, in a responsible way" (Amir Nahai, CEO Food and Beverage and lifestyle)		
Pol2.3. Objectives and annual plans regarding sustainable food management		Commitment to source 100% cage-free eggs by 2025	Commitment to source 100% cage-free eggs by 2025		Strategy to reduce waste to landfill by 45% and food waste by 50% by 2025 Commitment to source 100% cage-free eggs by 2025	Strategy to reduce food waste by 30% in 2020	X	Commitment to source 100% cage-free eggs by 2025
Pol3.1. Clear instructions for staff on sustainable food management		Staff is required to use the Hotel Kitchen toolkit (2020)	Education and training materials	X	Back-of-house poster in 14 languages to assist hotels in considering the best diversion option(s) Responsible seafood poster in 15 languages		Food waste prevention training and plans	

(continued)

Table 5.
Criteria for indicator of sustainable management of hotel food chain

Criteria for indicator	Meliá	Hilton	IHG	NH	Marriott	Accor	Hyatt	Wyndham
Pol4.1. Invest in technological innovation to reduce waste	Project implemented with Leanpath to measure the food waste generated in buffet services and staff canteens by installing scales and devices with artificial intelligence placed in the waste bins	60% reduction in buffet waste in 6 hotels in Egypt and the Middle East through use of food waste measurement technologies	AI technology pilot with Winnow Solutions that can reduce food waste by tracking usage and better informing future purchasing choices in 24 hotels in the Middle East	Projects carried out with companies such as Winnow, which combines the waste generated in kitchens with AI, identifying the type of waste being thrown out, at what time, what quantity and providing useful information to reduce food wastage	The Bangkok Marriott Marquis Queen's Park collaborated with LightBlue Environmental Consulting to implement a food waste reduction program, that resulted in a reduction of 30.2 US tons (27.4 metric tons) of food waste from September to December 2018			
Pur1.1. Purchase of local food	X	50% of brands include at least one brand standard requiring local sourcing		X	Commitment to sourcing 50% locally by 2025	Commitment to offer at least 10 regional products in 2020	X	
Pur1.2. Purchase of seasonal food				X		Commitment to ensure that 75% of fruits or vegetables are seasonal in 2020	X	
Pur1.3. Purchase of fair trade beverage and food	X					Commitment to offer certified responsibly produced coffee or tea at breakfast in 2020		

(*continued*)

Table 5.

Criteria for indicator	Meliá	Hilton	IHG	NH	Marriott	Accor	Hyatt	Wyndham
Pur1.4. Use of ecological and organically produced food	X			X	Responsibly source 95% in Top 10 priority categories by 2025	Commitment to ensure that breakfast, lunch and dinner selections include at least two key products (e.g. cereal and fruit) that are organic or certified agroecological products in 2020	Menus with a focus on portion control and calorie counts – as well as fat, sodium and additive amounts Fresh and wholesome options, including natural meats without supplemental growth hormones or antibiotics, and beverages with all-natural sweeteners Hyatt promotes hormone-free milk as the beverage of choice and make free refills of non-fat or low-fat milk available Hyatt often serves naturally raised beef and pork	
Pur1.5. Purchase of food involving air transport								
Pur1.6. Purchase of imported food						Preference for nonimported products		
Pur1.7. Purchase of food involving vegetables grown in greenhouses								

(continued)

Table 5.

Criteria for indicator	Meliá	Hilton	IHG	NH	Marriott	Accor	Hyatt	Wyndham
Pur1.8. Ban on the use of food containing GMOs							In 2018, Hyatt introduced the Beyond Burger™, a 100% plant-based burger made without gluten, soy or GMOs, at some hotels in the US	
Pur1.9. Offering tap water								
Pur2.1. Identification of the positive and negative sustainability impacts of suppliers	Commitment to purchase products excluding endangered species	X	X	X		Commitment to ban several endangered fish species in 2020	X	X

(*continued*)

Table 5.

Table 5.

Criteria for indicator	Meliá	Hilton	IHG	NH	Marriott	Accor	Hyatt	Wyndham
Pur2.2. Working with sustainable suppliers	Commitment to purchase products respecting for the environment and animal welfare	Cage-free eggs: 89% of spend in USA; 77% of spend in Europe. Commitment to sourcing 100% cage-free eggs by 2025. Seafood: 80 hotels in 6 countries have achieved Marine Stewardship Council (MSC) and/or Aquaculture Stewardship Council (ASC) Chain of Custody certification. Hilton encourages its suppliers to implement humane procedures to prevent the mistreatment of animals. Commitment to protect endangered species	Commitment to sourcing 100% cage-free eggs by 2025. Commitment to 90% of IHG top seafood products being sustainably sourced. Prohibition of shark fin being served in IHG hotel bars and restaurants	Promoting the use of eggs laid by free range hens, and sustainable fishing	17.2% MSC or ASC certified seafood in 2018. In 2018, hotels in Europe procured 58% of eggs cage-free. Commitment to sourcing 100% cage-free eggs by 2025	Preference for suppliers committed to animal welfare and for fish products from sustainable fisheries, where available	90% of eggs at managed hotels in the USA and Canada are cage-free. Worked with suppliers in the USA that support the GAP (Global Animal Partnership) principles for broiler chickens. Sourcing more than 50% of global seafood responsibly	Commitment to provide hotels exclusively with suppliers of cage-free eggs by 2025

(continued)

Criteria for indicator	Meliá	Hilton	IHG	NH	Marriott	Accor	Hyatt	Wyndham
Pur2.3. Informing suppliers about sustainability commitments and encouraging them to follow sustainability criteria	Code of Ethics for Suppliers (Meliá Hotels International, 2018)	X	IHG Green Supplier scorecard to understand the environmental credentials of prospective IHG suppliers—45% of new contracts through IHG tendering processes, awarded to an IHG Green Supplier	X		Commitment to work with suppliers adopting animal welfare practices	Encouraged one of Hyatt's largest pork suppliers to convert several pig farms to group sow houses	Supplier Code of Conduct (Wyndham, Hotels & Resorts, 2019)
Pur2.4. Involvement of supplier in reduction of waste	Required by Code of Ethics for Suppliers (Meliá Hotels International, 2018)	Required by Hilton Responsible Sourcing Policy (Hilton, 2017)						
Pur3.1. Adaptation of quantities purchased to needs				Processes, technical data sheets and preparation standards in the production chain, based on a forecast of needs (orders), conservation and turnover of all products				
Pur4.1. Avoidance of single use packaging and purchasing overly overpacked products								

(continued)

Table 5.

Table 5.

Criteria for indicator	Meliá	Hilton	IHG	NH	Marriott	Accor	Hyatt	Wyndham
Self1. Self-supply				Urban vegetable gardens, in areas adjoining some of NH hotels Bee hives in five NH hotels		1,000 urban vegetable gardens in Accor hotels	Onsite herb or vegetable gardens and bee hives in some Hyatt hotels	
Prep1.1. Optimisation of storage management								
Prep1.2. Enhancement of order interval and no stock buying								
Prep2.1. Direct use of food near date of expiry								
Prep2.2. Long-term analysis of meals sold in order to adapt food orders								
Prep3.1. Use of renewable energy								
Prep3.2. Use of energy-efficient cooking							Hyatt hotels are working to reduce the use of fossil fuels and energy, as well as the use of oils and water in food preparation	
Prep3.3. Outsourcing energy-intensive food preparation in-house								
Prep3.4. Prepare meals only after order								

Criteria for indicator	Meliá	Hilton	IHG	NH	Marriott	Accor	Hyatt	Wyndham
Prep3.5. Waste sorting while cooking								
Prep3.6. Using same ingredients in multiple recipes		Reduction of the total number of ingredients used by cross-utilising the same ingredients in different preparations (Hotel Kitchen Toolkit, 2020)					Reduction of the total number of ingredients used by cross-utilising the same ingredients in different preparations (Hotel Kitchen Toolkit, 2020)	
Off1.1. Sensitisation of customers to the field of food waste and the causes of food waste						X		
Off1.2. Recommend less carbon intensive dishes		World's first hotel company to sign the World Resource Institute's Cool Food (2020) Pledge, committing to reduce food-related emissions by promoting plant-based menu items					Beyond Meat™ options Gluten-free and vegan options Hyatt's For Kids By Kids menus offer fruits or vegetables as the standard side dish	
Off1.3. Increasing tolerance of customers towards sustainability measures through communication	Promoting responsible, healthy and sustainable consumption amongst its customers and employees					X	X	

(continued)

Table 5.

Table 5.

Criteria for indicator	Meliá	Hilton	IHG	NH	Marriott	Accor	Hyatt	Wyndham
Off1.4. Survey of reasons for plate waste using feedback sheets								
Off2.1. Quantity of high impact food offered								
Off2.2. Quantity of low impact food offered: Potatoes, grain, chicken								
Off2.3. Quantity of questionable species offered								
Off2.4. Existence of attractive vegetarian offer	Commitment to strengthen dining experiences with an offer rich in vegetables, whole grain cereals, legumes and fruit, reducing the use of processed products			"Breakfast Juice Corner" (healthy shakes and freshly squeezed juice) "Regional Corner" in breakfasts (special local products) "Green corner" (healthy and vitamin-rich products, in meetings breaks)		X	Gluten-free and vegan options on select menus	
Off2.5. Existence of fast food								
Off3.1. Adaptation of portion and plate sizes to customer needs							The Beyond Burger™, a 100% plant-based burger Children's menus encourage them to eat well and be well with right-sized options	

(*continued*)

Criteria for indicator	Meliá	Hilton	IHG	NH	Marriott	Accor	Hyatt	Wyndham
Off3.2. Organization of buffets so less carbon-intensive foods are at the centre								
Off3.3. Reduce portion sizes at buffets with more regular replenishment							Pilot program to reduce portion sizes at Hyatt Regency Orlando (Himelstein, 2017)	
Off3.4. Use of small serving bowls at the buffet								
Off3.5. No meals for presentation purposes only								
WasI.1. Existence of control of production losses and its origins	Project to measure the food waste generated in buffet services and staff canteens	Project with the lodging industry and WWF to develop a methodology for measuring food waste. Food waste program. Commitment to reduce food waste sent to landfill by 50%	Artificial Intelligence (AI) technology pilot to reduce food waste	AI pilot projects to reduce waste generated in kitchens	Since 2018, Marriott is incorporating waste metrics into the Marriott Environmental Sustainability Hub to track progress. Pilot food waste reduction program resulted in a reduction of 30.2 US tons (27.4 metric tons) of food waste from September to December 2018. Commitment to reducing waste to landfill by 45% and food waste by 50% (from 2016) by 2025		In-depth food waste audits at select hotels in the USA and Europe	

(*continued*)

Table 5.

Table 5.

Criteria for indicator	Meliá	Hilton	IHG	NH	Marriott	Accor	Hyatt	Wyndham
Was2.1. Total weight of waste		6M + pounds of food waste diverted from landfills by Americas hotels	IHG's food waste per occupied rooms (kg) in 2019: 0.70			X		
Was2.2. Separation of food waste per national legislation, but with a minimum of three categories				Types of waste separated: paper/ cardboard, glass, used oil, packaging and organic				
Was2.3. Disposal methods used								
Was2.4. Total weight of non-hazardous waste, with a breakdown by disposal method								
Was2.5. Adequate management of waste							23% of managed hotels globally have exceeded a 40% waste diversion rate in 2019 Every managed hotel will divert >40% of its waste from landfills by 2020	Basic and advanced recycling Waste diversion rate: 28% in 2019. Commitment to establishing targets by 2021
Was3.1. Strategies for managing overproduction of food cooked and not used							In-hotel recycling	
Was3.2. Fast cooling down of food								

(*continued*)

Criteria for indicator	Meliá	Hilton	IHG	NH	Marriott	Accor	Hyatt	Wyndham
Was4.1. Disposable items for take away	Commitment to replace all plastic packaging in food and beverage services in INNSIDE by Meliá hotels	Global ban on plastic straws, cocktail picks and stir sticks; Removed plastic water bottles from all meetings and events at most of managed hotels	In 2018, pledge to remove plastic straws	Elimination of plastic straws in all NH hotels (i.e. 1.1 million plastic straws per year); In 2020, plastic cups in rooms, sweet wrappers, amongst others, are replaced with more sustainable alternatives	"Skip the Straw" program: reduction of 1 billion plastic straws and 250 million plastic stirrers; "Straw upon request" service strategy: paper-based or other alternative straw when needed	Intention to eliminate all single-use plastic items visible to guests by 2022	Environmentally friendly packaging and to-go products; Removed plastic straws and intention to eliminate all single-use plastic disposables	Commitment to eliminate single-use plastic
Was4.2. Possible donation of food to local charities	Some hotels in Barcelona (Spain) donate food through NGO	Food donation by all managed hotels across the USA and Canada	In Australia, partnership with OzHarvest to divert food waste from IHG hotels to local communities via charities		Commitment with local charities for food donation		Donation programs with NGO for excess edible food; 50% increase in the number of hotels reporting donation of excess food in 2019	Donation program
Was4.3. Deliver remaining food from buffet or other to a cafeteria								
Was4.4. Other ways of reuse of leftovers		Food waste reduction in 2019 through composting, recycling, energy from waste incineration and other diversion opportunities; 890 Hilton hotels globally have implemented composting programs	In Europe, partnership with Too Good To Go (app that connects its customers with leftover food to purchase for a small cost); Food waste composted per occupied room in 2019: 0.07 kg	CorktoCork cork recovery programme: more than 8,000 m2 of cork for insulation and lining for new refurbishment at NH hotels		Partnership with Too Good to Go since 2016: more than 650 Accor hotels have enabled 450,000 meals to be saved in 11 European countries (i.e. 225 tons of waste prevented)	Alternative methods of managing inedible food waste will be used where feasible; Pilot app to sell surplus food at a discount; In-hotel composting	Food waste composting

Note(s): Blank: no information available
X: mentioned, without details
Source(s): Authors' proposal from the hotel groups corporate websites

Table 5.

performance referred to the food service. Indeed, it is quite common to find vague descriptions of the actions implemented to improve sustainable management of the hotel food chain: We could only find a single public statement by one manager on the relevance of food sustainability in his hotel group, and only two objectives regarding food waste amongst the websites and sustainability reports of the eight hotels examined.

Another remarkable fact is that while some hotel groups express their commitment to some goals, others have merely "encouraged" the hotels in their groups to implement some sustainable practices. Similarly, some hotel groups seem to be more demanding regarding the conditions their suppliers have to comply with than those of other groups. These differences in the level of commitment may be related to the fact that in some groups, there is a high proportion of franchised hotels in comparison to managed hotels, so that control on the operations (due to decentralised purchases, managerial and commercial autonomy) and the level of compliance with goals may not be guaranteed. In this way, Hyatt has focussed its efforts in North America where it has centralised purchasing of the food and beverage and operating supplies of its sources within the USA, Canada and the Caribbean. Nearly all of its contracts have an environmental policy in place. This may limit the scaling up of pilot projects implemented in some hotels to other establishments of the hotel group.

No evidence or anecdotal accounts were found regarding the consideration of some criteria or implementation of some practices by these eight hotel groups. This is the case of actions regarding food preparation: Even if those hotels implementing the Hotel Kitchen Toolkit (2020) are assumed to implement actions in this sense, they have not been mentioned in the sustainability reports of these hotel groups. Furthermore, only one hotel group refers to some actions to raise customers' awareness of food waste and the causes of food waste; this may be explained by the belief that "people do not want to be preached to as they are going through the breakfast buffet", according to Pete Pearson, director of food waste at the World Wildlife Fund (Himelstein, 2017). Only scarce and vague accounts are included in the hotels' sustainability reports regarding actions towards increasing tolerance of customers towards sustainability measures through communication.

When trying to increase the sustainability of the hotel food chain, several difficulties may be encountered. In this sense, for instance, Hyatt acknowledges not having achieved its objectives regarding sourcing more than 50% of global seafood responsibly (only achieving this in the United States), stating "we did not achieve our overall goal, but we increased our understanding of the challenges and made progress despite the unanticipated difficulty in accessing information on seafood origins".

Conclusion and future research
Conclusion and key findings
The aim of the paper is to propose and test the relevance of a comprehensive framework for different stakeholders to assess, report or make decisions regarding sustainable food management in hotels, considering the different aspects of the food supply chain. The desk research focussed on the corporate websites and sustainability reports of some global hotel groups and revealed significant differences between these organisations regarding the nature, quality and scope of the information provided on sustainable food management. These exasperating disparities in the disclosure of information affect the different dimensions of the food supply chain, with some clear "blind spots" in certain aspects of the chain being identified (e.g. food preparation and food provision). Thus, in the case of many hotel groups, there is room for improvement regarding the quality and quantity of the information on the sustainability of their food management practices. The information reported is generally limited to a few aspects of this issue, is not organised in a logical order, does not permit comparability over time or with other hotels and is mostly based on vague proclamations rather than on specific dimensions and indicators.

Even though this situation may be due to various causes (e.g. low motivation, difficulties in consolidating data from different countries/regions, absence of regulations), a relevant factor regarding this information gap is the lack of comprehensive approaches offering consistent concepts, dimensions or criteria that may provide a meaningful set of sustainable food management indicators (Fennell and Bowyer, 2020). The present research aims to provide a framework to assess, report or make decisions regarding sustainable food management in hotels by considering the different aspects of the food supply chain. The framework's implementation has been determined by using the publicly available information from hotels excelling in sustainability reporting.

Theoretical contributions
Even though some sustainability standards, hotel green labels and academic literature offer interesting insights, they do not constitute a consistent and relevant proposal for making decisions or for reporting (Agyeiwaah *et al.*, 2017). They range from very broad standards on sustainability (e.g. GRI), which on the whole are hardly relevant for hotels, to very specific indicators on some limited aspects of food management (such as recent academic contributions on food waste). The proposed framework aimed to identify relevant dimensions and criteria for sustainable food management in hotels, going beyond food waste. In particular, purchasing and self-supply, preparation, provision and waste policies have been identified as key aspects. Several specific dimensions and criteria have been determined for each of these aspects and have proved to be relevant for the exploration of cases; for example, in identifying the "blind spots" in hotels' reporting and assessing areas for improvement. In any case, these aspects, dimensions and indicators can be considered as starting points for further developments in the proposal of a comprehensive and relevant framework to measure, communicate and improve sustainable food management in hotels. Given that our conclusions are mainly drawn from the secondary data available on hotel chain websites, digital platforms such as Booking.com and Tripadvisor may also be useful channels for these hospitality companies to develop environmental discourse, as indicated by Mariani and Borghi (2021).

Practical implications
The evidence obtained from a sample of benchmark hotels suggests companies in this sector have room for improvement in a great number of as yet unconsidered aspects of food management, as well as on the quality and quantity of this information. A comprehensive framework such as that proposed in this paper may be of great interest to identify evidence of good practice amongst companies in this industry, as well as to address neglected aspects of sustainability in hotel food management, thereby helping hotels, users of hotel services and communities to make more informed decisions. In particular, these results may help destination marketers and destination managers encourage hotels operating in a destination to cooperate with stakeholders to reduce food waste and, in so doing, potentially help bring about improved sustainable food management throughout the entire destination area, as suggested by Mariani (2016).

Limitations and research agenda
The present research suffers from two main limitations. First, the coding process was performed manually and independently by the researchers of the team, based on their extensive knowledge of the subject and sector. Notwithstanding, computer-aided coding with the use of specific software for content analysis may have enriched the results obtained or enabled cross-validation of the findings. Second, due to the extent of the study required for

each case, only eight hotel groups were analysed. Further research should adopt a design and methodology that permits the analysis of a substantially larger sample of establishments. Finally, further research may make use of member checking interviews with managers working in the hotel chains analysed to confirm the coding and clear up potential biases, thereby enabling validation to confirm the reliability of the proposed framework.

Overall, we understand that the present research may be of interest in order to advance academic debates towards a more embracing and relevant understanding of sustainable food management in hotels and on the indicators needed in this respect. Given that a proactive posture is considered to be a key driver of the adaptive resilience and performance of hospitality firms in the era of COVID-19 (Sobaih *et al.*, 2021), we also consider that this study may inspire further research in other hospitality activities to promote sustainable tourism development and address further existing social, economic and environmental challenges.

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