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LEISURE & TOURISM | RESEARCH ARTICLE

Hotel food waste in Cyprus: An exploratory case study of hotels in Limassol

Petros Demetriou^{1,2*}

Abstract: This paper examines the reasons why large quantities of unconsumed food are wasted in the Cypriot hotel industry, and makes suggestions for the reduction of this wastage. The research focuses on hotels located in the town of Limassol. The paper aims to provide solutions for hotel food not to be wasted if not consumed by customers. It also examines whether hoteliers simply are not interested in reducing food waste, or whether there are implications that restrict them from doing so. The importance of this paper is that it deals with food waste in the hotel industry from the supply side (hoteliers/hotel owners and hotel managers) rather than the demand side (hotel customers). The paper uses qualitative methods (interviews) and literature review to examine the aforementioned issues. The paper also investigates whether the biggest food bank/charity organisation in the town of Limassol could collaborate with hotels for excess food to be donated to the town's hungry citizens. It concludes that although there are ways for food not to go to waste in the hotel industry, certain barriers must be overcome.

Subjects: Hotel Management; The Hospitality Industry; Food Safety Management; Hospitality Management; Tourism Management; The Business of Tourism; The Tourism Industry; Sustainability; Tourism Ethics; Tourism Behaviour

Keywords: food waste; hotel industry; sustainability

1. Introduction

Food waste is a major concern from both a societal and an environmental view. Waste is a sustainability challenge, as it poses substantial impact on public health and the environment (Thyberg & Tonjes, 2016). Food waste may be defined as a state in which edible food goes uneaten due to a supply chain inefficiency, which may be the result of consumers', supply chain managers' or other stakeholders' decisions (Cicatiello et al., 2016). Food waste in the hospitality sector has been



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Petros Demetriou currently works as a Lecturer at the Cyprus University of Technology (CUT) and the Open University of Cyprus (OUC). He holds a PhD in Sociology, an MBA, an MA in International Relations from King's College (University of London), a BA in Sociology and a BA in Political Sciences. His research interests include sustainability issues, strategic thought, business management, hotel and tourism management, and disability issues. The research reported in this paper — food wastage in the tourism sector — relates directly to sustainability. Sustainability offers the opportunity of fostering eco-friendly methods and therefore assists in reducing the carbon footprint in the tourism sector.

PUBLIC INTEREST STATEMENT

Reducing food waste in the hotel industry provides a step towards sustainability in the wider society vis-a-vis the reduction of the industry's carbon footprint. The aim of this research is to provide solutions so that hotel food is not wasted if not consumed by customers. To achieve these solutions, hoteliers/hotel owners need to fully engage in this effort. At this stage, policy implications restrict them from fully doing so. To tackle the issue, it is important to deal with food wastage in the hotel industry from the supply side, not just the demand side (hotel owners and hotel managers). To this end, food banks/charity organisations could cooperate with hotels for excess food to be donated to the needy.

defined as unwanted and disposed food, such as leftovers from guests' plates or leftovers from meal preparation that occur during cooking (Pirani & Arafat, 2016), or even stored food. For the purpose of this study, food waste is defined as the amount of food wasted in hotel foodservice chains, with food referring to "edible products" for human consumption (FAO, 2011). For the hospitality sector, where operations produce large amounts of waste, this issue is of critical importance (Pirani & Arafat, 2016). Food wastage at the retail/consumer end seems to be higher in developed countries WRAP (2013a), yet there are an estimated 842 million people in developing countries experiencing chronic hunger (FAO, 2013). The question of whether food wastage can be reduced is therefore raised.

Avoidable food waste is both a moral and an ethical issue. Solid waste and the misdistribution of food globally means that millions of people—mostly in developing countries—live without the necessary quantities of food. Though wasted food resources in developed countries can be used to alleviate hunger issues of many deprived people, this will not directly solve the issue of hunger in developing countries. Food waste is in itself problematic because of its negative impact on biodiversity, scarce resources, and climate change that harms humans, flora, fauna and the biosphere (Gustavsson et al., 2011; Parfitt et al., 2010; Reisinger et al., 2011). The acknowledgement of food waste was made at the United Nations Conference on Sustainable Development (Rio +20) as part of the Zero Hunger Challenge (OECD/OECD/FAO, 2013).

Wasting food means losing life-supporting nutrition for deprived people, as well as depleting scarce resources like water, land and energy that were expended in the distribution, processing and production of food. According to the FAO (2011), around thirty-three percent of world food production for human consumption, or 1.3 billion tonnes, is lost or wasted each year throughout the entire supply chain (from agricultural production to household consumption). Eighty-eight million tonnes of food within the European Union are wasted each year. This is the equivalent of 173 kilos per person. In addition, 170 million tonnes of carbon dioxide is emitted from production and disposal of EU food waste. Furthermore, for every kilo of food produced, 4.5 kilos of carbon dioxide are released into the atmosphere (FAO, 2013).

Food waste occurs throughout the stages of the supply chain. This paper widens the conceptual and territorial reach of research on food waste. The focus of the paper is to examine whether food wastage in the hospitality sector of Cyprus can be minimized and whether hotel unconsumed food can be redistributed. This is an understudied topic in the country of Cyprus. This paper examines whether it is hoteliers who are not interested in reducing the waste, or whether there are policy implications which restrict them from doing so. This research addresses a dearth of investigation into food waste in the hotel industry from the supply side (hoteliers/hotel owners and food supply managers) rather than the demand side (hotel customers).

2. Literature review & theoretical framework

The need to mitigate wastage is politically recognised. For example, that the European Commission has asked its member-states to fulfil the United Nations Sustainable Development Goal by setting wastage reduction targets (Katsarova, 2016). Up to date, no significant empirical work has been undertaken on food waste management in the national sectors of food service provision in the EU *per se* (Filimonau et al., 2019a)(2019b).

2.1. The case of the republic of Cyprus

Globally, enough food is produced to feed 7.2 billion people; however, one-third of the food produced is wasted every year. Cyprus, an EU member country, has one of the highest ecological footprint consumption rates as opposed to production (Galli et al., 2017) and a high wastage rate with considerable environmental, health and socioeconomic impacts. Given the current consumption and wastage status of Cyprus, it was identified as a country of interest in which to conduct this research. Food waste is unethical, not only because it means that food that could have been redirected/provided to people needing food is needlessly thrown in the landfill, but also because it has serious environmental implications (Foley et al., 2011; Halloran et al., 2014; Radwan et al.,

2012). The breakup of the waste within the EU is as follows: 5% from retail/wholesale, 11% from primary production, 12% from food service/catering, 19% from food processing and 53% from households. In the case of Cyprus, it is estimated that 327 kilos of food per person each year is wasted, the third worst in the EU (European Union, 2012).

Following the global financial crisis, there has been an avalanche of studies in the area of food waste (Papargyropoulou et al., 2014; Parfitt et al., 2010; Priefer et al., 2016). Some studied the state of practice in the UK (Evans, 2012), others in Nordic countries (Gjerris & Gaiani, 2013) and others in Australia (Devin & Richards, 2018). Coley et al. (2011) and FAO (2013) studied the distance food needs to “travel” in order to be consumed and its subsequent carbon footprints. Other researchers have studied compositing of food into fertilisers (Radwan et al., 2012; Sealey & Smith, 2014) or its conversion to biofuel (Gouranga, 2017). Thyberg and Tonjes (2016) asked for the implementation of policies which target food waste and for development of actions that lead to the reduction of food waste. More specifically, Thyberg and Tonjes (2016) make reference to policies such as limited liability regulations for donors, tax incentives for donors, and programmes to facilitate the connection between those in need and donors. Mensah (2007) and others (Juvan et al., 2018; Priefer et al., 2016; Radwan et al., 2012) made specific reference to the hotel industry.

Among the United Nations Sustainable Development Goals, the 12th goal focuses on “responsible consumption and production.” The main targets of the goal are: a) to reduce food losses across supply chains, b) implement sustainable consumption and production, c) eliminate inefficient fossil-fuel subsidies and promote large-scale public procurement practices and d) improve product life-cycle management for reducing waste (UN, 2019). Target 12.3 of the 12th goal deals specifically with the issue of food waste and food loss; 12.3.1 is about food loss whereas 12.3.2 is about food waste (Bacatariu et al., 2017). Almost one billion people go undernourished and another billion go hungry. The food sector itself accounts for about 22% of total greenhouse gas emissions and 30% of the world’s total energy consumption (UN, 2019).

In the UK, the hospitality industry is responsible for over 3.4 million tonnes of waste annually; in Europe, including Cyprus, it is estimated that 1 kg of waste is produced on a daily basis by an average user of hospitality services (WRAP, 2013b). The 3.4 million tonnes of food waste generated by the UK hospitality industry accounts for 88% of the amount of waste in the industry in 2011 (Parfitt et al., 2013). In 2010, the hospitality industry across the EU produced over 12 million tonnes of food waste (Oliveira et al., 2016).

The Republic of Cyprus is a country whose economy mostly relies on offering services in areas such as the hospitality and tourism sector. Therefore, the hospitality and tourism sector is very important for the GDP of the country. According to data from the World Travel and Tourism Council (2018), in 2017 and 2018 the total contribution to GDP of travel and tourism was 22.3% and 29% respectively. The total contribution of travel and tourism to employment to GDP was 22.7% and 29.1% respectively. Furthermore, in 2017 there were 3,652,073 tourist arrivals in Cyprus (CYSTAT, 2019). Cyprus is an attractive destination for tourists, especially between the months of April and October. According to CYSTAT (2019), p. 3,652,073 tourists visited Cyprus in 2017, and there has been an upward trend since then.

It is common for tour operators to offer “all-inclusive” packages as holiday option (Cyprus Mail, 2013). This way tourists can eat breakfast, lunch and dinner (buffet meals) at the hotel rather than visit other restaurants. This buffet option results in high wastage at every meal and contributes to the food waste problem (Cyprus Mail, 2015). Buffets boast high customer satisfaction (Kim et al., 2010). They are a type of meal service in which guests make their own choices and can eat as much as they like (Cohen & Avieli, 2004). Though buffets customers generally report higher levels of satisfaction than with à la carte service (Kim et al., 2010), buffets tend to increase food consumption and waste (Juvan et al., 2018). With “all-inclusive” packages, buffet food waste is

difficult to control, as customers are incentivised monetarily to consume more food (Kuo & Shih, 2016), because they prepaid for it.

Buffets are just one of many reasons large quantities of unconsumed food are wasted in the Cypriot hotel industry. The objective is to prevent food wastage from taking place. The main research question of this study is: What are the reasons causing food wastage in hotels and how can they be mitigated if not eliminated? Unfortunately, hotel managers do not always have the skills to identify and quantify the main food waste occurrence within their hotels (Sakaguchi et al., 2018). Operational procedures, such as ordering the optimum quantity of food needed via accurate forecasting of consumer demand, can significantly reduce waste in a hotel unit (WRAP, 2013c). While it seems straightforward to achieve these operational procedures, they are in fact difficult for hotel managers to execute. According to Papargyropoulou et al. (2016), this is due to the unpredictable nature of customer food demand when in an “out-of-home” setting and high seasonality. Sub-research questions include:

- (1) Are hoteliers/hotel owners/hotel managers interested in mitigating food waste?
- (2) Are there any implications that restrict hotels from mitigating food wastage?
- (3) Do charities and food banks accept unconsumed food donations from hotels?
- (4) Does redistribution of unconsumed hotel food take place in Limassol?
- (5) What is the contribution of the state and/or local authorities in the redistribution process (if any)?

There are more than two hundred hotels in Cyprus, of which around sixty are located in Limassol. Given the popularity of Cyprus and the fully mature hotel industry on the Island, the researcher interviewed hoteliers/hotel owners and hotel managers in the town of Limassol. Limassol is the second-largest town in Cyprus and is located on the south coastline of the country, 61 km from the capital Nicosia. Limassol was also selected for this study because it has been the subject of media coverage (Cyprus Mail, 2016, 2017) due to many families lacking basic food access—an unfamiliar phenomenon in Cyprus up until now. Food banks and charitable organisations have been established by various groups such as churches. Surplus food may be redistributed (donated) to these charities. The lack of cohesion between the hotels throwing away perfectly good food and the food banks needing more food to accommodate people in need accelerated the need for this research. Among the local charities, the Charitable Brotherhood (2020) of the Holy Metropolis Church in Limassol is the biggest.

In this paper, the grounded theory instead of framework analysis is used. Framework analysis involves a five-step process: 1) familiarisation, 2) identifying a thematic framework, 3) indexing, 4) charting, and 5) mapping and interpretation (Ritchie & Spencer, 1994). Grounded theory has its own set of procedures, such as theoretical sampling and open coding (Srivastava & Thomson, 2009). It is more specific and detailed, and therefore was chosen for this study. Repeated ideas, concepts and elements are tagged with codes. Codes are then grouped into concepts and categories (Charmaz, 2006). Grounded theory uses a set of systematic methods for conducting qualitative research, with an aim to extract new results and develop knowledge. According to Charmaz (2012), it denotes dual referents: a) a method consisting of flexible methodological strategies and b) the products of this type of inquiry. The aim is to develop original knowledge directly from data analysis. Any results therefore are built on strong empirical foundations. Subsequently, the researcher may develop solid conclusions that explain the empirical phenomena under study. Its significance lies in the facts that: a) it provides specific guidelines for conducting qualitative research, b) it offers ways for handling the phases of research, c) it integrates analysis with data collection, d) it facilitates analysis of qualitative data, and e) it promotes qualitative research into science (Bryant & Charmaz, 2007).

According to Tie et al. (2019), grounded theory research involves purposive sampling, data collection, coding and analysis. Researchers purposively select participants who are relevant to the

research questions. Data collected are coded. The analytical process is then used to identify main themes and similarities between interviewees' answers. This process is by no means easy to operationalise, but if applied correctly, it provides credible research results (Charmaz & Bryant, 2011).

Grounded theory was considered the most suitable for conducting qualitative research for this study. The reasons were: a) in the case of the hotel sector in the country of Cyprus, purposive sampling was essential to facilitate data collection and b) since no other academic research regarding hotel food wastage and sustainability has focused on this country, a theory that develops original knowledge should be adopted.

2.2. The issue of sustainability

The term "sustainability" is frequently used in the tourism industry. This is due to the multiple negative impacts attributed to hospitality sector operations that need to be addressed (Legrand et al., 2016). With regards to the environment, the impacts include water consumption (Deng & Burnett, 2002), waste generation and food waste (Radwan et al., 2012) to name a few. Sustainability may include the idea that the use of tourism resources should be regulated in order not to be polluted or depleted in such a way that they will not be available for use by future generations (Mensah, 2007). The importance of sustainability in corporate business policies has been recognised by hospitality scholars (Jones et al., 2016). Sustainability practices may help hotels reduce operational costs (Erdogan & Baris, 2007), achieve regulatory compliance (Kasim, 2009), gain competitive advantage (Graci & Dodds, 2008), improve employee productivity (Sourvinou & Filimonau, 2018), achieve shareholders' expectations and build consumer loyalty (Mihalic et al., 2012). The research agenda on sustainability management in the hospitality industry is rapidly evolving.

The huge amounts of food waste produced in food supply chains and the long-term effect on social, economic and environmental sustainability has been recognised (Garrone et al., 2014). The issue of food waste has been considered in the context of agriculture (Hodges et al., 2011) and grocery retail (Filimonau & Gherbin, 2017), but the hospitality sector has largely been excluded from the analysis (Papargyropoulou et al., 2016; Pirani & Arafat, 2014). Food waste occurs at different stages of hotel operations, as hotel units generate increasingly larger quantities of food waste due to the rise in consumers' income and the growing trend of food consumption on the go. Furthermore, guest expectations of the hotel products in terms of quality and quantity is a factor that motivates hotel managers to prioritise guests' satisfaction over food wastage (Filimonau et al., 2020a).

Food distribution and retail play a significant role in food supply chains by connecting consumers and suppliers (Eriksson et al., 2012). Furthermore, either directly or indirectly, hotel units can influence consumer behaviour and choice to make them more responsible (Filimonau et al., 2017), though the industry is currently reluctant to do so (Filimonau et al., 2020a). This emphasises the need for in-depth research on the issue of food waste in the hospitality sector, with the aim of finding key operational areas that must be targeted for outlining responsible business practice examples and mitigation. At the same time, if the hotel industry is to be an active contributor to sustainable development, it needs to find ways to encourage sustainable consumption and production patterns.

Pirani and Arafat (2016) observed that timing, service styles and inaccuracies in predicting the number of customers are significant contributors to food waste. Studies of service preparation found that overproduction in the preparation stage is also a significant cause of food waste (Aamir et al., 2018; Bharucha, 2018). To better understand the importance of the hospitality sector food waste and to mitigate the situation, hospitality unit managers need to reflect upon their experience and knowledge in dealing with such issues (Martin-Rios et al., 2018). To achieve this, managers are required to understand the causes of hospitality food waste generation, the scale and scope, and the elements of environmental impact (Filimonau et al., 2011). To understand the

scale and scope of food waste in the hospitality sector, it is important to characterise and quantify it.

Overstocking of food and overproduction of meals are typical results of inaccurate demand forecasting in hotels. Thus, establishing a good relationship with suppliers may facilitate food waste minimisation. This would help hotel managers order optimum quantities of food when and if needed (Derqui et al., 2016). The causes of hospitality sector food waste generation are also linked to effective mitigation on the consumer side. If consumers are irresponsible, this will result in significant food wastage. Educating hotel guests about the negative societal impact of food waste may assist in limiting the waste (Jagau & Vyrastekova, 2017). Hoteliers may also appeal to customers' consciences by making them aware of the consequences of food being wasted (Stockli et al., 2018). However, hotel managers may be reluctant to experiment with their customers' consuming behaviour, in fear of losing their loyalty (Filimonau et al., 2020b).

Qi and Roe (2017) studied how consumer knowledge regarding the effects of food waste may affect their behaviour. When consumers were informed about the negative outcomes of food waste, the total amount of food waste was significantly reduced. Chen and Jai (2018) argue that consumers with pre-existing concerns about the environment are more likely to respond positively to food waste mitigation programmes. However, a study by WRAP (2007) found that customers may respond negatively to such information. In this study, 33% of participants actively resisted reminders to reduce food waste and 26% gave up on the effort. Managing this behaviour within the hospitality sector is difficult due to volatile customer loyalty, high competition and limited resources. These various challenges need to be evaluated by hotel unit managers when acting, as suggested by corporate social responsibility theory (CSR) (McWilliams and Siegel, 2001).

Environmental management is a crucial element of the CSR agenda and is gaining traction within the hospitality sector (Martinez & Del Bosque, 2013). However, limited resources may prevent hotel managers from engaging in environmental protection (Filimonau et al., 2019a). The aforementioned challenges discourage managers from prioritising the redistribution of unconsumed food; however, the willingness of hotel managers to address these challenges is determined by their understanding of the benefits and value of this waste mitigation (Tzschentke et al., 2008).

Mitigation can only be achieved if managers and employees understand the moral dimensions and negative social and environmental impacts of food waste. With this knowledge, hotel groups can devise solutions within their business operations to mitigate food waste, and work towards achieving the 12th SDG of the United Nations (UN, 2019). The hotels in Cyprus use the resources of the local environment to maximize their profits and achieve their business goals. As members of this society, hotels have a responsibility to act ethically and mitigate any negative impacts of their actions. CSR involves acknowledging these negative impacts and formulating strategies to overcome them.

A recent Cyprus Sustainable Tourism Initiative survey (CSTI, 2014), indicated that more than half of customers choosing "all-inclusive" packages would pay more to taste local produce in the hotel resort. Buffets are the form of meals in which hotel guests choose and serve themselves food from big tables. Buffets are very common in the hospitality industry. Buffets typically offer a variety of food (starters, salads, main courses, fruits and desserts), allowing guests a number of food choices (Kuo & Shih, 2016). However, typically more food is taken but not eaten, as people overload their plates due to the variety and amount at no additional cost (Quan & Wang, 2004). Moreover, tourists may want to experiment with local food, but might not like it and thus waste it.

Strict rules regarding the time food sits on buffets illustrate the role of hotel policies in food waste generation (Irani et al., 2018). Up to 75% of hotel food waste could be avoided via effective management (Engstrom & Carlsson-Kanyama, 2004). Inefficient food inventory management and

poor demand forecasting are examples of mismanagement which lead to wastage (Pirani & Arafat, 2016).

High demand for food, and the subsequent food waste, negatively impacts the environment, as more food needs to be produced, transported, stored and processed. There is also higher demand for water, land use and low-paid labour. But what happens to all that food wasted at hotel buffets (e.g., leftovers and unconsumed food)? Preventative approaches that aim to divert food waste from landfills should be prioritised. At the same time, the aim is not to “punish” tourists for having fun and indulging themselves at meals (Juvan et al., 2018). Having said that, it is reasonable to conclude that buffets are responsible for increased food waste. Therefore, this study focuses on what happens to food waste in the hotel industry in the town of Limassol.

3. Methodology and empirical application

Though the issue of food waste is recognised as important for the sustainability of hospitality sectors globally (Grandhi & Singh, 2016), there is scant information regarding the magnitude of hospitality food waste generation. Even within the EU, no single cohesive method to quantify, monitor and characterise food waste across major economic sectors exists (European Commission, 2015). Therefore, it is difficult to comprehend the magnitude and establish trends in hospitality food waste generation. This lack of understanding restrains mitigation measures from both a managerial and policy-making perspective. To address this problem, it is necessary to produce reliable research on hotel food waste. This research should encompass the scope of hotel units to enable understanding of the diversity of sizes and managerial methods, alongside the determinants of food consumption and wastage (Holloway & Jefferson, 2013).

This research deals with the issue of hotel food waste in Cyprus, which is severely under-studied. Organisational, political, societal and managerial contexts in which this challenging issue takes place have not been explored up until now. The importance of this study is that it deals with food waste in the hotel industry from the supply side (hoteliers/hotel owners and hotel managers) rather than the demand side (hotel customers). The study investigates managerial approaches to hotel food waste mitigation.

Previous studies used questionnaire surveys (Des Grosbois, 2012; Enright & Newton, 2004) to investigate issues in the hotel industry. However, it is evident that such surveys tend to be inconclusive due to small response size. Furthermore, the hotel manager/hotelier population is small in size and has restricted accessibility. For these reasons, this study uses qualitative instead of quantitative methods; semi-structured interviews with hoteliers and food supply managers were conducted. Qualitative research was considered the most appropriate method, given the sensitive and exploratory nature of the topic at hand (Matthews & Ross, 2014). Qualitative research was also chosen because it explores human behaviour and attitudes under complex and unpredictable circumstances, i.e., food waste management in hotel operations (Tzschentke et al., 2008).

A purposive sampling approach was used following Radwan et al. (2012), as this is considered appropriate when dealing with small populations and limited access. The effort was to ensure the research included opinions of managers from a range of hotels in Limassol that were broadly characteristic of the Cypriot hotel sector. A total of thirty-three ($n = 33$) semi-structured interviews were conducted. This number includes nine hoteliers/hotel owners, 23 food and beverage managers, and a manager of a charity that provides meals to those in need. Given the small size of the country, the sample size is adequate and representative. Semi-structured interviews were adopted due to their flexibility, which facilitates the detailed investigation of specific questions and topics. Interviews provide flexibility in exploratory analysis and therefore provide scope for in-depth research of specific topical courses (Veal, 2011). Semi-structured interviews are also capable of revealing participants’ true attitudes and opinions on sensitive topics of great corporate and societal importance, such as hotel food waste and its redistribution opportunities (Ghuri & Gronhaug, 2005). All interviewees were assured of anonymity and confidentiality in any written

publications or reports. [Table 1](#) provides the gender, role and the main theme from each interviewee.

The town of Limassol was chosen due to its large number of hotel units. All empirical material used for the study of food waste in Limassol hotels was drawn from a qualitative study. This study was conducted in two rounds and lasted for twelve months (July 2018—June 2019). The initial round involved 15 interviewees, and the second round involved another 18 interviewees. In both rounds, the same questions were posed. Interviews were recorded and anonymity and confidentiality were ensured. This research method has been used in various similar studies regarding food waste (e.g., Evans, 2012). Interviews were conducted in Greek, with a subsequent English translation performed by a professional language translator. No incentives were offered to the participants.

Hotel managers and hoteliers from 38 hotel units in Limassol were contacted and asked whether they would be willing to be interviewed face-to-face and in depth with regards to food management in their units. Some of them politely declined the call due to “time limitation” and “busy schedule” but 32 were willing to be interviewed. Participants were recruited via personal contacts (convenience sampling), which is appropriate when targeting a population limited in access and number (Adams et al., 2007) such as hotel unit managers and hoteliers. The recruitment criteria included: 1) position (manager or owner) within the hotel sector unit and 2) at least two years of work experience in the current position. The first round of interviews included 15 interviews with hoteliers and hotel managers. In the second round, 17 interviews with hoteliers and hotel managers were conducted, as well as an interview with the manager of the biggest food bank/charity organisation in the town of Limassol. According to Marshall et al. (2013), saturation in qualitative methods is achieved with around 30 interviews, which is in line with this study.

The hotel units were chosen with regards to their size (small to large), which means the sizes of the units varied due to number of rooms (from 58 to 224). The intention was to get a clearer indication of what happens in the sector with regards to food waste and unit size (Robinson, 2014). Eight of them were five-star hotels, nine were four-star hotels, twelve were three-star hotels and three were two-star hotels. One of the research goals was to investigate the waste in relation to practices and ways in which the hotel staff plan and shop for food, consumption, storage and disposal. The in-depth interviews, which lasted from 50 to 90 minutes each, took place at the hotel unit in which each interviewee works, following the method applied by Ritchie et al. (2014). Semi-structured interviews consisting of open-ended questions were conducted in line with Jankowicz (2005) in order to understand participants’ knowledge and understanding vis-a-vis food waste, the cause of it, and whether they are addressing it.

Participants were asked to supply answers based on their experiences. The responses were quite variable in focus and detail. Data were analysed using grounded theory approach so that themes emerged from the data (Corbin & Strauss, 2008; Gray, 2004). Following the interview, the data was transcribed by reading the text and coding it. Repeated ideas, elements or concepts become apparent and were tagged with codes ([Table 1](#)). Relevant text was then identified (Glaser & Strauss, 2009). After data were collected and reviewed, codes were grouped into concepts and then categories. Data were coded in terms of food waste management practices, management awareness, and management attitudes to identify innovative practices with regards to food waste. Emergent practices deemed innovative were identified through the process of rearranging and reducing data into comprehensible and manageable forms, as per the principles of the theory. The limitation with grounded theory is that it is not easy to identify all innovative practices in a workplace linked with food waste, and its methods tend to produce large amount of data that may be difficult to handle (Olesen, 2007).

Questions addressed challenges in waste management, cost and barriers to food waste management, attitudes and motivation toward waste, experiences with food waste, examples of waste causes and how these were managed in the hotel units. There were also questions regarding

Table 1. Interview participants (n = 33)

Pseudonym	Gender	Role	Theme/Code
Interviewee 1	Male	Hotelier/Hotel Owner (5-star unit)	Customer satisfaction importance/Sector Competitiveness
Interviewee 2	Female	Hotel Manager (4-star unit)	Pre-planning meals and uncooked food shopping/Reduction of costs
Interviewee 3	Male	Hotelier/Hotel Owner (3-star unit)	Discard unconsumed food rather than donate/Food safety laws
Interviewee 4	Male	Hotel Manager (4-star unit)	Staff participation in wastage reduction schemes and training/Reduction of Costs
Interviewee 5	Male	Hotel Manager (5-star unit)	Monitoring of room bookings (based on unit capacity)/Reduction of costs
Interviewee 6	Female	Hotelier/Hotel Owner (3-star unit)	Discard unconsumed food rather than donate/Logistics and storage
Interviewee 7	Male	Hotel Manager (4-star unit)	Staff participation in wastage reduction schemes and training/Reduction of Costs
Interviewee 8	Male	Hotel Manager (5-star unit)	Unconsumed food usage in garden/Composting
Interviewee 9	Male	Hotel Manager (3-star unit)	Importance of positive reviews by customers/Sector Competitiveness
Interviewee 10	Male	Hotel Manager (3-star unit)	Donation of unconsumed food to dog sanctuaries/Food safety laws
Interviewee 11	Male	Hotelier/Hotel Owner (5-star unit)	Monitoring of room bookings (based on unit capacity)/Reduction of excess food purchase
Interviewee 12	Male	Hotel Manager (4-star unit)	No redistribution of unconsumed food/Food safety laws
Interviewee 13	Female	Hotel Manager (3-star unit)	No communication between hotel units or local authorities for redistribution of unconsumed food/Logistics and storage
Interviewee 14	Male	Hotelier/Hotel Owner (4-star unit)	Monitoring of room bookings (based on unit capacity)/Reduction of excess food purchase
Interviewee 15	Male	Hotel Manager (3-star unit)	Discard unconsumed food rather than donate/Logistics and storage
Interviewee 16	Male	Hotel Manager (5-star unit)	Discard unconsumed food rather than donate/Food safety laws
Interviewee 17	Male	Hotel Manager (3-star unit)	Importance of positive reviews by customers/Sector Competitiveness

(Continued)

Pseudonym	Gender	Role	Theme/Code
Interviewee 18	Female	Hotel Manager (2-star unit)	No communication between hotel units or local authorities for redistribution of unconsumed food/ Logistics and storage
Interviewee 19	Male	Hotelier/Hotel Owner (4-star unit)	Unconsumed food not used as fertiliser due to smell/Composting
Interviewee 20	Male	Hotel Manager (3-star unit)	Donation of unconsumed (non-meaty) food to pig farms/Food safety laws
Interviewee 21	Male	Hotel Manager (5-star unit)	Staff participation in wastage reduction schemes and training/ Reduction of Costs
Interviewee 22	Female	Hotel Manager (2-star unit)	Unconsumed food usage in garden/Composting
Interviewee 23	Male	Hotelier/Hotel Owner (3-star unit)	Correct in-hotel food storing/Reduction of costs
Interviewee 24	Female	Hotel Manager (4-star unit)	No redistribution of unconsumed food/Food safety laws
Interviewee 25	Male	Hotel Manager (5-star unit)	Discard unconsumed food rather than donate/ Food safety laws
Interviewee 26	Male	Hotelier/Hotel Owner (3-star unit)	No redistribution of unconsumed food/Food safety laws
Interviewee 27	Male	Hotel Manager (4-star unit)	Unconsumed food not used as fertiliser due to smell/Composting
Interviewee 28	Female	Hotel Manager (3-star unit)	Staff participation in wastage reduction schemes and training/ Reduction of Costs
Interviewee 29	Male	Hotel Manager (4-star unit)	Discard unconsumed food rather than donate/ Food safety laws
Interviewee 30	Male	Hotelier/Hotel Owner (3-star unit)	Discard unconsumed food rather than donate/ Food safety laws
Interviewee 31	Male	Hotel Manager (5-star unit)	Correct in-hotel food storing/Reduction of costs
Interviewee 32	Male	Hotel Manager (2-star unit)	Correct in-hotel food storing/Reduction of costs
Interviewee 33	Male	Charity/Food Bank Manager	No cooked or expired food donations accepted/ Food safety laws Uncooked, not expired food donations accepted/ Food safety laws

whether hotels composted their food waste or planned to do so—and if not, why, as well as whether hotels donated unconsumed food to charities and if not, why. The questions encouraged participants to describe their experiences and share their knowledge regarding these matters (Bryman, 2012). The replies on these varied. Big-hotel managers dealt with more issues of food waste than those of medium and small hotels; this was in line with Radwan et al. (2012). Vegetables, fruits, cooked food and desserts were among the waste.

Specific questions were also asked in order to understand perceptions of hoteliers and hotel managers on the issue of food wastage in the hospitality sector. These were:

- Are customers or hoteliers/hotel owners responsible for food wastage? If not, in your perception whose responsibility is it?
- Is food waste an issue of concern in the hotel sector in Cyprus?
- Is excess food donated to food banks or charities?

These open-ended questions were intended to reveal how informants perceived the scale of wastage in the industry, who is involved in the process of wastage and whether CSR was applied during the processes. Questions were open-ended in order to allow interviewees to elaborate and share their views, as this type of question yields in-depth responses about people's perceptions, feelings and experiences (Patton, 2014). After careful consideration of the interviewees' answers, the thematic clusters that follow in Section 4 were established.

4. Results and discussion

From the qualitative research conducted, the most important themes and results were that: 1) the hospitality sector competitiveness is to blame for food waste in the sector, 2) careful planning, CSR and composting may reduce hotel units functioning costs, 3) logistics and food safety legislation restrict unconsumed food redistribution, 4) health safety legislation restricts acceptance of food donations, and finally 5) important policy implications need to be overcome in order for food waste to be reduced. These are elaborated in detail below.

4.1. Hospitality sector competitiveness is to blame

Specifications were highlighted as a major contributor to food waste by all interviewees and there seemed to be a consensus that this is the correct thing to do. It was quite surprising to hear interviewees mention that such demands did not mostly come from tourists/consumers; they were imposed by top hotel unit managers, in order to satisfy customers. In other words, participants favoured the role of large food portions as a mean to customer satisfaction. This undermines the claim that tourists' demands drive waste. For example, it was mentioned that: "Fresh fruit and vegetables were rejected on the basis of colour, size and shape," which is in line with Papargyropoulou et al. (2016). When asked whether they knew that storing fruit and vegetables in conditions that maximise their shelf life has better potential to reduce waste, one response was: "Yes we know that already, but if we advertise fresh food, then fresh and not frozen food must be served." Corporate business policies could instead enable this food to be reused either for donations or in-house personnel meals. With guest satisfaction and safety in mind, it becomes difficult for staff and line managers to engage in food waste reduction (Charlebois et al., 2015).

Food disposal is the final step in waste management and should only be employed after all other prevention-oriented measures have been examined (Papargyropoulou et al., 2014). When asked to quantify food wastage in their hotels, the participants were not able to provide exact figures; they only offered rough estimates of the amount of wasted food. This inability of providing accurate figures may be explained by the need to prioritise operational procedures such as customer satisfaction and revenue management in an effort to achieve corporate goals, which is in line with Martin-Rios et al. (2018) and Filimonau et al. (2019a).

Cypriot hotel units must utilise more eco-friendly approaches to food waste management that target food waste mitigation. This goal may be achieved by adjusting corporate strategy and by addressing behaviours that lead to food waste (Thyberg & Tonjes, 2016). Interviewee 1 stated: “The hotel provides in buffets what a tourist would like and even more; in this way we keep our customers happy and satisfied.” None of the managers seemed to be willing to encourage customers to waste less food. The majority rejected the possibility of manipulating consumer behaviour to reduce food wastage due to fear of customer dissatisfaction. As Kallbekken and Saelen (2013) suggested, this behaviour indicates that hotel guest satisfaction is prioritised over other considerations, such as environmental sustainability. Interviewee 9 stated: “Look, we work in a very competitive industry. If we ask customers to waste less, they will probably go on and leave bad reviews for the hotel on social media, thus making the hotel less attractive to other potential customers ... for us this is a no-go area.” Despite this, when asked regarding their willingness to at least put tips from tourists toward preventing food waste, they seemed willing to discuss the matter.

Buffets were originally designed to encourage customers to take as much as they can consume. However, in the contemporary context, buffets encourage consumption of uneaten food with subsequent wastage (Gössling et al., 2011). Papargyropoulou et al. (2016) suggest that replacing buffets with à la carte service may prevent hotel units from wasting food. Though à la carte may also generate food wastage, hotel employees may effectively influence consumer choices during ordering. Buffets are operated on a walk-in basis, which limits staff's ability to predict exact customer numbers; therefore food surplus is produced in order to meet the needs of potential customers, or when customers exceed forecast numbers (Pirani & Arafat, 2014). Unfortunately, hotel managers tend to like being “on the safe side” by ordering larger than required quantities of food, given that under-prediction may lead to consumer dissatisfaction (Gruber et al., 2016). When asked whether “all you can eat” buffets should utilize smaller-sized plates so that tourists could return to buffet tables should they still feel like doing so (Priefer et al., 2016), some managers burst into laughter. According to Interviewee 17: “A big chunk of our marketing policy is dedicated to promoting the country's cuisine. We can't on the one hand promote the local cuisine, then when people come to the hotel, give them a hard time with their meals. The local cuisine is one of the most important competitive advantages we have against the competition ... if we go with your suggestion then we will lose future customers.”

4.2. Careful planning, CSR and composting may reduce hotel units functioning costs

Effective demand forecasting management techniques are important in order for food wastage to be reduced (Gössling et al., 2011). These will enable hotel managers to order only as much food as necessary, and prevent wastage during the pre-cooking stage. Stock audits should also be applied. The “first in first out” (FIFO) technique uses older food items in storage before new items, and may assist in reducing wastage (Charlebois et al., 2015). When it comes to planning meals and shopping for food, it was asked whether such planning occurs beforehand as suggested by Evans (2012). Interviewee 31 said: “Yes, we check levels of food in our storage room and refrigerators prior to shopping. We then make a ‘shopping list’ and order what we need from our suppliers. We are also aware of our storage room and refrigerator capacity when submitting an order to the suppliers.”

Depending on the size of the unit, we were told that this procedure may happen either on a daily up to a weekly basis. Big hotels repeat these procedures on a daily basis, while smaller hotel units do this every 2–3 days, and one small unit does this once a week. On the other hand, Interviewee 32 told us that when they run out of something, they go to the grocery next door, indicating a lack of thorough planning.

Effective food storage was identified as a way to reduce food waste. Interviewee 23 stated: “In our storage room's shelves, we store up front food which expiry date comes earlier, and put those with a later expiry date behind; this method prevents food from going wasted.” To minimise wastage of

food due to expire, managers regularly monitor the “use by” dates in their inventories. Those with the nearest expiration dates go on the front of the shelf, thus ensuring they get used first.

With regards to food preparation, we were told that only foods (e.g., meat, eggs and dairy products) which will be cooked are thawed or unrefrigerated. This practice is in line with Candell (2001).

Participants claimed to have control over the anticipation of the number of customers and subsequent food orders. Muriana (2017) states that forecasting is linked to the ratio between the actual number of customers and the number of customers that are expected to come to a hotel. Failure in predicting this proportion determines the amount of food that will be wasted.

According to Interviewee 11, only quantities of food needed are being used: “When it comes to tourists, we know the capacity of our unit and how many of them are in the hotel. In this way, we cook meals accordingly and limit food waste as much as we can.” Unfortunately, this was not the case with smaller hotel units. According to Interviewee 14: “We try to do our best in this area, but it is not always easy to achieve. About a month ago the indications were for the full capacity of the unit to be reached. A tour operator had booked the hotel for a large group of tourists, and even paid an amount in advance, only to cancel the reservation two days before the group’s expected arrival. Meanwhile we had already purchased what we thought would be the needed quantity of food ... vegetable, fruit, milk, etc. Needless to say, most of it was never used.” Pirani and Arafat (2016) and Gruber et al. (2016) argue that most hospitality enterprises refrain from taking the risk of underestimating the amount of food required to satisfy customer demand and tend to order more food than necessary. As Interviewee 14 admitted, occasionally forecasts do not end up being accurate, and this generates food waste.

Training kitchen employees and chefs aids in the mitigation of food waste in hotels (Goh & Jie, 2019). Therefore, it can be argued that Cypriot hoteliers and hotel managers should invest in staff training on food waste mitigation. When redesigning kitchen methods, staff participation does not seem to be an issue (Dong-Gyu & Lee, 2017; Sakaguchi et al., 2018); most interviewees felt that with the right guidance, all staff would agree to participate in such a scheme. The fear of losing their employment otherwise would also motivate personnel to participate. They also stated that there is good communication between them and their staff. Financial incentives, however, were out of the question for the interviewees. According to Quedstedt et al. (2013), engaging with people on a one-to-one basis can be extremely effective due to the fact that people have different barriers to overcome. This kind of engagement allows advice to be tailored highly to each individual. The main challenge is influencing sufficient numbers of people to make a sizeable difference on the population as a whole.

The issue of CSR in the food supply chain is well documented (Devin & Richards, 2018) and was also mentioned by most of the interviewees. None of them, however, seemed to see the moral/ethical aspects of food wasting. Nobody mentioned anything regarding the connection of ethics and food waste in their hotels. It is therefore determined that many managers do not see CSR the way they should. Hotel managers and hoteliers have realised that they could save money when adopting conservation practices. It could be argued then that when hotel units refer to CSR, their aim is to cut costs related to food waste while also managing their public image, rather than making a genuine commitment to act responsibly when it comes to waste. The hotel and tourism industry statements regarding CSR have done little to reduce food waste in the industry.

Food waste can also be disposed of by composting (Radwan et al., 2012). While one of the last resorts in food waste management, composting food waste is preferred to landfill disposal, as it minimises environmental impacts and costs if executed effectively (WRAP, 2013c). Composting reforms the composition of food waste for subsequent use as fertiliser (Singh et al., 2014). However, it did not appeal to most interviewees, as they thought the process will be dirty, smelly and time-wasting. In contrast, 67% of hospitality units in the U.A.E. engage in composting, making it a prime measure for food waste re-usage (Pirani & Arafat, 2016). Only two interviewees (8 and 22) mentioned that food composting takes place in their hotel units.

Contrary to the perception of other interviewees, they found the method cheap and relatively easy to execute. As Interviewee 8 says: “We use the compost in our garden. Our gardener is more than handy with this. Banana skins ... fruit and vegetable leftovers and basically everything that is left on plates go into a specially adapted container. We let it rot down and the gardener also throws in an activator to expedite the process. He then turns it over continuously, and within three months it turns into soil which he spreads in the garden. It is not dirty, it’s odourless and is relatively easy. It’s beyond comprehension why others don’t do this, as it saves costs because instead of paying to dispose the waste, we return it back to earth in our garden.”

Even though hotel kitchen staff could learn to sort food waste relatively quickly, there are some challenges to be tackled in order for this to work: a) the physical investment of time in moving, redistributing and storing the food leftovers by hotel staff, b) the cost involved in hauling and processing food waste, and c) the logistics involved with regards to coordination of picking up and redistributing a variety of food waste accumulation (Sealey & Smith, 2014). The feasibility of composting food waste is globally recognised. For example, Sandals Emerald Bay in the Bahamas composts around 70 tonnes of food waste within a seven-month period (Sealey & Smith, 2014).

4.3 Logistics and food safety laws restrict unconsumed food redistribution

Food donation is considered to be a significant tool in reducing food waste and fighting social inequality (Schneider, 2013). In 2013, around 500,000 tonnes of unconsumed food were redirected to charity organisations by hospitality units, grocery retailers and individual consumers worldwide (Food and Agriculture Organisation of the United Nations, 2015). In the UK, the Courtauld Commitment has united hospitality enterprises and grocery retailers in a voluntary attempt to develop effective ways to manage unconsumed food. In this initiative, charities developed partnerships with businesses to donate unsold food to destitute people (WRAP, 2017). This is something that does not often take place in the Cypriot hospitality sector. When it does occur, it is done on an individual basis, according to interviewees 10 and 20. Interviewees 6 and 15 identified that it was cheaper for their hotel units to discard excess food rather than pay for transport costs to a charitable organisation or a food bank. Unavailability of no-cost logistics and storage units (i.e., freezers and refrigerators) constitute other barriers against donating food to charitable organisations and food banks, according to interviewees 13 and 18. Both these interviewees expressed a strong commitment to donating food not consumed should these issues be somehow resolved. At the same time, it was noted that neither charitable organisations nor local authorities were willing to provide free logistics to collect food from hotel units, and the option of contracting private carriers did not appeal to them.

As the examples of the hospitality sectors in Sweden and Poland show, state support is essential in facilitating food redistribution from hotel units (Bohdanowicz, 2006) and therefore similar support must be provided in the case of Cyprus. Good communication and cooperation with charities in collecting unconsumed food from hotel units and distributing it to those in need were also highlighted. However, as the case of the Charitable Brotherhood below indicates, charities do not always possess the means to handle food donations in Cyprus. Hotel managers claimed to be willing to mitigate food waste and to allocate resources to this effort, but indicated limited governmental support in food redistribution as a main constraint. Governmental and local authorities’ support is of great significance in reducing barriers to food waste mitigation in the hospitality sector and in promoting actors’ engagements towards this effort (Bohdanowicz, 2007; Giroto et al., 2015). The engagement of hotels and charities in food redistribution should be facilitated by targeted policy interventions, which is also supported by food waste studies in the Swiss hospitality sector (Betz et al., 2015; Canali et al., 2016).

Only two interviewees (10 and 20) mentioned donating unconsumed food for animal feed. This was done on an individual basis. Specifically, Interviewee 10 said he selects food leftovers (unconsumed food) from the hotel kitchen and takes them to a dog sanctuary just outside the town of Limassol. Interviewee 20 mentioned that a friend of his owns a pig farm and asked him whether he could pick up food leftovers (non-meaty unconsumed food) to feed the pigs: “The hotel agreed

for this to take place, but also clarified that no responsibility would be taken on the hotel's behalf if any health issues occurred in the pig farm.”

France has legislated that supermarkets cannot dump surplus food, but must donate it at very least for animal feed (White, 2015). If similar laws were adopted for hotel units in Cyprus, due to the plethora of swine farms in the country, the phenomenon of donating unconsumed food for animal feed could become the norm (Cyprus Mail, 2018).

Of particular interest was the question posed by Interviewee 26 regarding whether charitable organisations would face legal issues if they serve precooked meals to the needy: “Are you sure charitable organisations will have no law issues if they serve precooked hotel food? As a hotel unit, we have the Public Health Services department of the Ministry of Health paying frequent visits to our kitchen ... wouldn't the same be happening with charitable organisations or are health services lenient with them?” Hoteliers are restricted by EU regulations on donating unconsumed food (Boeck et al., 2017). This was indicated as a major factor in their reluctance to donate unconsumed food to charities and food banks. Safety and health standards were also described as being inflexible. These issues needed clarification and were therefore marked down as issues that needed to be discussed when contacting a charitable organisation. As demonstrated by Sakaguchi et al. (2018), hotels are discouraged from donating food due to potential liability in terms of safety and health. Hermsdorf et al. (2017) mention that the issue of legal liability for food donations by hotel units persists outside Cyprus, and this indicates a global problem in need of resolution via legislation and policies.

4.3. Safety laws restrict acceptance of food donations: the case of the Charitable Brotherhood

Aside from reducing food waste, food donations and redistribution assist in combating hunger and social inequality. At the same time, donations provide reputational benefits for the enterprises involved (Schneider, 2013). In a town where there are quite a few destitute citizens who live below subsistence level and rely on food banks and charitable organisations, e.g., the Charitable Brotherhood (2020) of the Holy Metropolis (Church) of Limassol, a moral issue arises. This is intriguing, as unconsumed food could be used to feed the destitute citizens of the town of Limassol. Initially the research focus was on what hotel units do with regards to food waste. From the interviews conducted and based on emerging schemes around the EU—such as the Finnish campaign “Food from Leftovers” where families are given leftover food from supermarkets alongside receipts and counselling sessions on how to reduce food waste (Gjerris & Gaiani, 2013)—it was decided to explore the idea of donating unconsumed food from hotels to charitable organisations or food banks.

One of the bigger food banks in Limassol is the Charitable Brotherhood of the Holy Metropolis (Church) of Limassol. Thus, the decision was made to contact and interview the manager of the Brotherhood (Interviewee 33). According to the Church of Limassol website, the Charitable Brotherhood prepares and offers daily over 1700 servings of free food to the destitute citizens of Limassol. It also offers 750 servings to the destitute students of the Cyprus University of Technology in the “Archontariki” (the big meal hall of the Church) of the Holy Metropolis in Limassol, in the precinct of the Metropolitan Church of Panagia (St. Mary) Pantanassis of Catholic (Charitable Brotherhood, 2020). Furthermore, the Church has established and operates a charitable centre named ‘Paramythia.’ The Paramythia centre offers free food and essentials such as clothes, footwear or other household items to the destitute citizens of Limassol.

The manager from the Charitable Brotherhood was willing to participate in the study and be interviewed in depth. Other studies (Evans, 2012; Parfitt et al., 2010) focused only on food wastage issues. In the current study, hoteliers, hotel managers as well as a potential receiver of leftover food (charity organisation) were interviewed. In this way the study does not restrict itself to the problem of food wastage in hotels, but also provides solutions for mitigating the wastage. When it was mentioned that one of the study's aims was to find whether unconsumed food in hotel units could be redistributed to charities, the Brotherhood's manager smiled grimly

“To be honest with you, this is something we have investigated in the past ... do you know how many offers we get from restaurants (mostly) and hotels for unconsumed food? Four, maybe five per day. Unfortunately, we unwillingly decline these offers.” When asked what he meant, he clarified that “The Public Health Services Department of the Ministry of Health keep coming here to check our food standards. To serve pre-cooked food under these circumstances is out of the question. We have been told that if someone goes ill ... even if s/he implies s/he was harmed from food we served, we will have legal issues.” This is not a national, but an international issue; Bohdanowicz (2006) mentions that due to legal challenges, only 17.4% and 32.3% of excess hospitality food are donated in Sweden and Poland, respectively.

When asked for examples of the problems the charity faces from the Public Health Services (2019) with regards to feeding the needy, the manager said: “the other day, about five dozens of fresh eggs were brought from a nearby monastery to be used when cooking. It just happened that the Public Health Services inspector came for a check. When he saw the eggs, we were ordered to throw them away. We had stored the eggs in a fridge, so we asked why should we do that? The inspector went on to say that these eggs did not have the red marking a stamp of approval from his department, and as these were not approved by his department, they were simply not good enough for consuming! I know this is insane, but this is what we deal with.”

To be fair to the Public Health Services department inspectors, the charity manager did say that to a degree it is understandable they act this way, due to the fact that they are obliged to monitor the implementation of strict EU food laws (European Commission, 2019b) and regulations.

Food banks and charities do not always possess the necessary labour, time and equipment to safely store and redistribute unconsumed hospitality food (Filimonau & de Coteau, 2019). A negative example of a food donor was described: “We received this call from a restaurant owner. The hotelier told us he had ordered half a ton of fresh sliced squid but was sent half a ton of unsliced squid instead, and therefore these could not be used in the hotel restaurant. Returning it to the supplier was not an option, and therefore he asked us to send some people to pick them up for free in order to be utilised by the charity. The charity relies mostly on volunteers, and no volunteers were available at the time. Having no other option, the fathers (priests) went out to bring the squids themselves. To carry half a ton of squids was not an easy task; they got tired and also got really dirty. When they came, we checked the squid, and to our great surprise we noticed the ‘use by’ date was a month old! Needless to say, all of it went to the bin.” According to FAO (2013), “use by” dates refer to the safety of high perishable foods (milk, fish or meat), whereas “best before” refers to the quality of food, meaning that it is still safe to consume even after that date. In this case, the only option for the charity was not to offer the squid for consumption to those in need.

Lastly, Interviewee 33 informed us of the procedures for preparing meals for the needy: “The volunteers come early in the morning to prepare the ingredients for the meals. The procedure of preparing and cooking around 2500 portions of food is quite lengthy. Everything needs to be freshly-cooked and be served by twelve noon.” When asked who supplies the raw materials for the meals, the manager replied: “We buy most of it on our own, but we do have donors as well, e.g., a big pasta industry provides spaghetti and other kind of pasta for free. Thank goodness these kinds of charitable acts keep happening these days.”

4.4. Policy implications

The effectiveness of food donations to charities is defined by the legal landscape of the country in which a hotel operates. Food safety standards may discourage the hospitality sector from mitigating food waste, because policies prohibit redistribution of unsold food and prioritise disposal (Thyberg & Tonjes, 2016). For example, law requires businesses to dispose of food that has been damaged during transportation and storage or that was incorrectly labelled (Heikkilä et al., 2016). In such a case, policies facilitate food waste rather than prevent it. Within the European Union, people understand food waste to mean food discarded from the supply chain which is still good

enough for human consumption. Such products are disposed of for appearance reasons or because of their “best before” or “use by” dates. Up until recently, the food waste concept had been overlooked due to the abundance of food. This in itself has led to large quantities of food waste at both consumer and production levels (European Parliament, 2011). At the same time, a clear understanding of the scale of this waste is on in both global and national levels.

European institutions, namely the European Commission and the European Parliament, have since 2011 put forward targets for reduction of food waste and food loss. In 2012, the European Parliament adopted a resolution to target food waste reduction. At the same time the European Commission asked for a 50% reduction of food waste by 2025 from the EU member states (European Parliament, 2012). The coherence and feasibility of such targets, bearing in mind that there is still a need to improve calculation of food waste along with identification and monitoring of potential solutions, has put into question whether this is an achievable policy. The EU waste framework directive (Directive 2008/98/EC of 19 November 2008) only recommends a set of specific food waste prevention targets. Therefore, at the moment the EU’s rhetoric can only provide lip service rather than facilitate mitigation.

Strict legislation may also restrain the redistribution of excess food. When it comes to food donations, legislation does not protect food donors; even worse, it makes them liable for any illnesses caused by donated food (Thyberg & Tonjes, 2016). This liability risk alongside the absence of tax relief for food donations have restricted hospitality sector units in Cyprus from donating unconsumed food (Deloitte, 2014). In Cyprus, the legal system does not restrict groups from being charitable (Cyprus Law, 2019) but as indicated above, the EU law which takes precedent over domestic law does. For this reason, Public Health Services (2019) are obliged to monitor the implementation of laws regarding food safety and thus make it difficult for charitable organisations and food banks to feed people with hotels’ food leftovers.

There are ways for the EU to resolve this matter. In order to do, so the EU must look no further than the United States. The United States in 1996 adopted Bill Emerson’s “Good Samaritan Act” which may limit the liability of donors. This legislation protects food donors from criminal and civil liability in case a product given in good faith to a charity organisation harms a recipient. Furthermore, the legislation may be seen as an endorsement of redistribution activities (Morenoff, 2002). It may be argued that Regulation (EC) No. 852/2004 provides an exception for charity organisations. According to the Regulation, the provisions should apply to a certain continuity of activities and a certain degree of organisations. Therefore, food banks and charity organisations may be seen as an exception.

4.5. Synoptic table of the respondents’ answers

The following content analysis table (Table 2) of the respondents’ answers, provides the main themes and codes deriving from the qualitative research conducted:

5. Conclusions

Food waste is a major challenge for the hospitality sector, globally and in Cyprus. Unfortunately, the issue remains academically understudied, especially from the perspective of industry professionals, which makes its management difficult. This study contributes to the existing knowledge by emphasising the significance of managerial decisions in hotel food wastage mitigation, and by examining whether excess (wasted) food in the hotel industry can otherwise be used (e.g., donated to charities). In addition, its originality lies in the fact that while most past research involving food donations negotiated the phenomenon from the perspective of food donors (Filimonau et al., 2019a), this study negotiates the phenomenon from both perspectives of both donors and receivers. That is, food donations are also addressed from the perspective of recipients (charities) and their (in)ability to accept donated food from the hospitality sector.

Table 2. Content analysis table (n = 33)

Interviewee	Meaningful Unit	Condensed Meaningful Unit	Code	Sub-Theme	Theme
I 1	“What matters for us is to have satisfied customers. If my customers are not happy, then I will lose them to competition.”	It is important to have satisfied customers, as there is fear due to the competitive sector environment.	Customer satisfaction importance	Sector Competitiveness	Customer Satisfaction is important
I 2	“Our kitchen manager has a weekly food purchase plan. He makes uncooked food purchases based on hotel bookings. This way no food is wasted.”	Food purchase planning reduces costs.	Pre-planning meals and uncooked food shopping	Reduction of costs	Pre-planning leads to the reduction of costs
I 3	“We always throw food leftovers in the bin. We are worried that if we donate unconsumed food and people fall ill, we’ll have issues with the Law.”	Food leftovers are thrown to the bin as managers worry about food safety laws.	Discard unconsumed food rather than donate	Food safety laws	Strict food safety laws lead to no unconsumed food donations
I 4	“Our staff is regularly trained on the issue of food wastage. This is important for our hotel, not just for the reduction of costs, but for CSR reasons as well.”	Training hotel personnel is important for reducing costs and promoting CSR.	Staff participation in wastage reduction schemes and training	Reduction of Costs and CSR	Personnel training reduces overall costs
I 5	“A thorough monitoring of room bookings in our hotel, is taking place well in advance to arrivals. Therefore we know how many guest we’ll have the week ahead and make only necessary food purchases.”	Monitoring bookings and knowing the hotel capacity assists in reducing costs.	Monitoring of room bookings (based on unit capacity)	Reduction of costs	Personnel training reduces overall costs

(Continued)

Table2. (Continued)

Interviewee	Meaningful Unit	Condensed Meaningful Unit	Code	Sub-Theme	Theme
I 6	“The reason unconsumed is not donated to charities, has to do with the hotel not having the means to deliver it to their premises.”	No logistics capacity on hotels behalf, leads to discarding unconsumed food.	Discard unconsumed food rather than donate	Logistics and storage	Logistics issues lead to discarding unconsumed food
I 7	“This year our hotel takes part in this food wastage reduction scheme. Not only we have managed to reduce the wastage, but we have also managed to reduce our costs.”	Participating in food wastage reduction schemes facilitates reduction of costs.	Staff participation in wastage reduction schemes and training	Reduction of Costs	Personnel training reduces overall costs
I 8	“Our gardener composts unconsumed food and then uses it in the hotel garden as fertiliser. I never thought food leftovers would become so useful!”	Food leftovers can be used as fertilisers.	Unconsumed food usage in garden	Composting	Unconsumed food can be composted and used as fertiliser
I 9	“In our sector, the most important thing is customer satisfaction. If I get bad reviews then I will miss out on future customers. No time for ecology here.”	Guest reviews are important, therefore hotel customers must be satisfied.	Importance of positive reviews by customers	Sector Competitiveness	Customer Satisfaction is important

(Continued)

Interviewee	Meaningful Unit	Condensed Meaningful Unit	Code	Sub-Theme	Theme
I 10	“The country is full of dog sanctuaries. It happens that one such a sanctuary in near the hotel and therefore we donate unconsumed food to them. We don’t donate to charities as we are worried about strict food safety laws.”	Dog sanctuaries accept donations of unconsumed food. There’s fear with donating to charities, due to strict food safety laws.	Donation of unconsumed food to dog sanctuaries	Food safety laws	Animal sanctuaries accept unconsumed food donations
I 11	“The most efficient way to avoid excess food purchases, is to know your hotel’s capacity and monitor your bookings.”	Monitoring bookings and knowing the hotel capacity, results in not making excess food purchases.	Monitoring of room bookings (based on unit capacity)	Reduction of excess food purchase	Pre-planning leads to the reduction of costs
I 12	“Food safety laws as they are now, do not allow for redistribution of unconsumed food to charities.”	Hoteliers worry about food safety laws and therefore do not redistribute unconsumed food to charities.	No redistribution of unconsumed food	Food safety laws	Strict food safety laws lead to no unconsumed food donations
I 13	“Local authorities should step up and take initiation for the redistribution of unconsumed food. Hotel units do not have the means to store or distribute food to charities.”	Local authorities do not facilitate food redistribution to charities and hotel units do not have the capacity to redistribute unconsumed food themselves.	No communication between hotel units or local authorities for redistribution of unconsumed food	Logistics and storage	Logistics issues lead to discarding unconsumed food
I 14	“We monitor our bookings on a daily basis. There is no reason to buy uncooked food if it’s not needed.”	Monitoring bookings leads to the reduction of excess food purchases.	Monitoring of room bookings (based on unit capacity)	Reduction of excess food purchase	Pre-planning leads to the reduction of costs

(Continued)

Table2. (Continued)

Interviewee	Meaningful Unit	Condensed Meaningful Unit	Code	Sub-Theme	Theme
I 15	“You want us to redistribute unconsumed food, but you refrain from letting us know by which means this will be done.”	Hoteliers want to be assisted with food redistribution.	Discard unconsumed food rather than donate	Logistics and storage	Logistics issues lead to discarding unconsumed food
I 16	“Look, I don’t want to get into trouble with the Law. This is the reason I throw away and don’t donate any unconsumed food.”	Strict food safety laws lead to unconsumed food being wasted.	Discard unconsumed food rather than donate	Food safety laws	Strict food safety laws lead to no unconsumed food donations
I 17	“Customer reviews are important for our hotel. If I tell customers to fill their plates with less food, so that it doesn’t go wasted, goodness knows what reviews I will get.”	Fear of bad reviews works against advising hotel customers not to fill their plates with unwanted food.	Importance of positive reviews by customers	Sector Competitiveness	Customer Satisfaction is important
I 18	“I once tried to get in touch with local authorities and ask them whether they could assist me with delivering unconsumed food to local charities. They told me they would get back to me ... they never did.”	Local authorities do not facilitate hotel units in redistributing unconsumed food.	No communication between hotel units or local authorities for redistribution of unconsumed food	Logistics and storage	Logistics issues lead to discarding unconsumed food
I 19	“Composting unconsumed food? Are you mad? I don’t want any bad smells in my garden.”	Hotels avoid composting due to odours.	Unconsumed food not used as fertiliser due to smell	Composting	Composting odours lead to unconsumed food being wasted

(Continued)

Interviewee	Meaningful Unit	Condensed Meaningful Unit	Code	Sub-Theme	Theme
I 20	“I know this guy who has a pig farm and deliver (non-meaty) unconsumed food from the hotel to his farm. The same can't be done for charities due to safety issues.”	Pig farms accept (non-meaty) unconsumed food donations. Some charities do not, due to food safety laws.	Donation of unconsumed (non-meaty) food to pig farms	Food safety laws	Animal sanctuaries accept unconsumed food donations
I 21	“I personally hold training courses with the hotel staff and explain them the importance of reducing wastage in the hotel. This is the most efficient way of reducing our costs.”	Personnel training in reducing wastage, leads to the reduction of overall costs.	Staff participation in wastage reduction schemes and training	Reduction of Costs	Personnel training reduces overall costs
I 22	“We have found a no-cost way to recycle unconsumed food. We use this food as a fertiliser in the hotel garden.”	Some hotel units use unconsumed food as fertiliser.	Unconsumed food usage in garden	Composting	Unconsumed food can be composted and used as fertiliser
I 23	“As the owner of this hotel, I take the issue of reducing costs seriously. Therefore, I explain to my staff how to correctly store uncooked food. In this way it will last for a longer period of time.”	Correct food storing leads to the reduction of overall costs.	Correct in-hotel food storing	Reduction of costs	Personnel training reduces overall costs
I 24	“Forget it ... we are not delivering unconsumed hotel food to charities. Who gets the blame if someone is poisoned or even implying getting ill from this food?”	Food safety laws fear, results in no redistribution of unconsumed food.	No redistribution of unconsumed food	Food safety laws	Strict food safety laws lead to no unconsumed food donations

(Continued)

Table2. (Continued)

Interviewee	Meaningful Unit	Condensed Meaningful Unit	Code	Sub-Theme	Theme
I 25	“I tell my personnel to discard any unconsumed food to the bin. I am not taking any gambles with peoples’ health.”	Food safety laws fear, results in discarding unconsumed food.	Discard unconsumed food rather than donate	Food safety laws	Strict food safety laws lead to no unconsumed food donations
I 26	“I once tried to redistribute unconsumed food to charities, but got rejected. I was told that themselves are worried not to poison any of the food receivers.”	Some charities reject unconsumed food donations, due to food safety laws.	No redistribution of unconsumed food	Food safety laws	Strict food safety laws lead to no unconsumed food donations
I 27	“No smells from rotting food in the hotel garden. Imagine the amount of flies this would attract!”	Smells from food leftovers contribute in attracting pests. Therefore leftovers are not used as fertilisers.	Unconsumed food not used as fertiliser due to smell	Composting	Composting odours lead to unconsumed food being wasted
I 28	“I brought this training team from abroad, who advised me and trained the hotel personnel in reducing wastage. Best money I ever spent! Hotel costs have gone down significantly.”	Personnel training in reducing wastage, may contribute in the reduction of overall costs.	Staff participation in wastage reduction schemes and training	Reduction of Costs	Personnel training reduces overall costs
I 29	“Not even charities accept unconsumed food from hotels these days. They are worried about the health of their ‘customers’. They want to avoid having issues with the Law.”	Some charities reject unconsumed food donations, due to food safety laws.	Discard unconsumed food rather than donate	Food safety laws	Strict food safety laws lead to no unconsumed food donations

(Continued)

Interviewee	Meaningful Unit	Condensed Meaningful Unit	Code	Sub-Theme	Theme
I 30	“My decision was to discard unconsumed food rather than donate. You never know what might happen. If something goes wrong whose fault is it?”	Fear of liability in case of food poisoning, results in discarding unconsumed food.	Discard unconsumed food rather than donate	Food safety laws	Strict food safety laws lead to no unconsumed food donations
I 31	“Tins and cans that are about to expire go to the front of the kitchen shelves. This way they are been used before their expiration date.”	Correct food storage leads to the reduction of discarding food.	Correct in-hotel food storing	Reduction of costs	Personnel training reduces overall costs
I 32	“Food that can be frozen and used at a later stage does so. This way it doesn't go wasted and the hotel saves some money.”	Correct food storage leads to the reduction of overall costs.	Correct in-hotel food storing	Reduction of costs	Personnel training reduces overall costs
I 33	“The Charity declines to accept any cooked or expired food donations. Our responsibility towards the receivers of our services is great. However we do accept unexpired or uncooked food donations.”	Cooked or expired food donations are not accepted by charities. Unexpired or uncooked food donations are accepted.	No cooked or expired food donations accepted/ Uncooked, not expired food donations accepted	Food safety laws	Charities can only accept certain food donations

The use of qualitative methods (in-depth interviews) has contributed to illustrating practices in the industry that lead to food wastage. The use of qualitative methods led to a significant number of interviews (thirty-three). The use of the semi-structured interview method facilitated interviewees to open up and express their opinions and experiences on the area freely. The end result was to elicit views that would not have been expressed with the use of quantitative methods. The paper provides a critical approach to hotel units' waste by elaborating on the many reasons which lead to food waste: oversized buffets, miscalculations of demand (number of tourists/customers), and EU hygiene rules (e.g., the two-hour guarantee on unrefrigerated products, the obligation to discard food once supplied by a catering service etc.). These reasons are why the chances are high for large proportions of food to go wasted (Priefer et al., 2016).

The literature revealed that there is no specific methodology on how to appraise the content and assess the volume of hospitality food waste. No adequate listing of good business practices that managers may adopt and utilise with regards to wastage exists at the moment. This paper suggests that hospitality food waste mitigation and human factors have an important role to play in food waste behaviour. Therefore, based on the results of the interviews conducted, the following practices are needed: compiling shopping lists of food, checking the dates and being aware of the meaning of date labelling (“best before” differs from “use by”), storing food in accordance with the instructions on the packaging, putting new food at the back of storage behind older food, using leftovers, freezing food and composting food leftovers (Gössling et al., 2011). Furthermore, interviews indicated that it is important to check food inventory in freezers, refrigerators and storage rooms prior to shopping in order to make an efficient shopping list that doesn’t create excess supply, which is in line with the first in first out (FIFO) technique suggested by Charlebois et al. (2015).

The aim is to facilitate hospitality managers in understanding the major causes of hotel industry food waste generation. Tackling food waste in the hospitality sector is achievable by offering smaller (individual) portion sizes, by planning the menus more carefully, planning meals in advance and by improving the working routine of hotel units, i.e., better operations management (Kallbekken & Saelen, 2013). With regards to portion sizes, smaller plates could be provided to buffet customers so as to minimize the risk of them taking more food than they can eat; they may return to the buffet tables for more food if they (Gössling et al., 2011); of course this may entail the risk of unsatisfied customers and bad reviews. Currently, interviewed hotel managers and owners are unwilling to engage hotel guests in food waste mitigation, due to the importance assigned to customer satisfaction within the hotel sector. Hotel staff should also be trained with regards to purchasing, storing, freezing and thawing food in order to reduce waste. Where applicable, advanced tools that may forecast food demand based on previous historical consumption data could be used and in this way reduce food waste.

The promotion of food redistribution programmes to charitable organisations or food banks, etc., is also important. The main barriers in the EU for this are legal and logistics constraints. Donors and redistributors of unconsumed food fear they may be liable in case a user claims harm from spoiled food. In the case of Cyprus, the domestic legal system does not restrict one from being charitable with leftover food (Cyprus Law, 2019), but the overarching EU law does. The Public Health Services (2019) are obliged to monitor the implementation of legislation regarding food safety and in this way make it difficult for charitable organisations and food banks to feed people with unconsumed hotel food.

Optimising the food waste regulatory framework in Cyprus in terms of health and safety standards applied to food donations is important. New legislation could limit the liability of donors and protect them from criminal and civil liability in the case food given in good faith to charity organisations harms a recipient (Morenoff, 2002) and should be introduced by the EU. Policy interventions should lessen the safety and health requirements regarding unconsumed/surplus food hoteliers wish to donate; this would in turn minimise liability concerns hotel managers have when doing so.

Unconsumed food may also be fed to animals. This has been applied in the case of France (White, 2015) which has legislated that supermarkets cannot dump surplus food, but must donate it at least for animal feed. In Cyprus, there are many animal farms (mostly pig farms) and dog sanctuaries which would be more than willing to make use of this excess food. When it comes to the former, food waste consumption must not include meat products as Regulation (EC) No 882/2004, Commission Regulation (EC) No 152/2009, and Commission Regulation (EU) No 691/2013 restrict this (European Commission, 2019a). Food leftovers may also be composted and used as fertiliser. Composting is a sustainable alternative for organic waste that offers environmental and economic value, and by producing material that can either be used as a soil nutrient or be sold for profit (Schaub & Leonard, 1996). The practice of this method in hotel units is well documented by Radwan et al. (2012).

The state and local authorities, alongside supporting agencies such as charities, must support efforts for food waste mitigation. Low adoption of food redistribution initiatives is attributed to the limited assistance offered to hotel units by the state and local authorities. The establishment of networks between hotels, the state and local authorities in order to exchange ideas and information on the issue will enable those lagging behind to learn from successful cases in this area. In this way, a critical mass will be formed and no one will feel “left behind” in this competitive industry. The experience that the state, local authorities and supporting agencies have on the issue would be more than useful to hospitality professionals and thus make the difference when it comes to limiting, or indeed eliminating, food waste. Furthermore, broader engagement with charities would reduce the pressure on internal resources in hotel units with regards to issues such as logistics, which was identified as another barrier regarding the mitigation of food waste.

A limitation of the study is the usage of qualitative research, which offers limited generalisability. After all, this is the first time a study negotiated food wastage in the Cypriot hotel sector. Thus, the outcome of the study should be considered exploratory rather than conclusive. A further limitation is that while an effort was made to detect social desirability bias in interviews and eliminate its occurrence, it may be the case that it affected interviewees’ responses, as it represents a well-established deficiency of managers’ interviews. Another limitation of the study is that it was based in a specific developed country, in which hotel service is arguably very competitive and hospitality professionals are reluctant to sacrifice much on the “altar” of CSR and food waste mitigation. Hence, it is possible that studies in different countries may yield different findings, and it would be interesting to see such studies. A final limitation of the study is that interviews for this paper were held prior to the COVID-19 pandemic. It is therefore possible that some of the interviewees’ answers may have been different if interviews were held today.

The *telos* of food wastage studies in the hospitality sector must be to contribute towards aiding the sector’s professionals to limit waste. Future academic research may focus on studying managerial approaches to hospitality sector food waste mitigation in both developed and developing countries. For the purpose of this paper, the case of Limassol in Cyprus was studied and compared to other developed countries. The findings of this study should be tested on a wider sample of hotel managers in Cyprus. A comparison of Limassol hotels vis-a-vis hotels in other Cypriot towns (e.g., Famagusta & Paphos), or indeed a comparison of Cyprus to other major holiday destinations in the region (e.g., Egypt, Greece and Turkey) will provide diversified analysis and may contribute towards the adoption and application of innovative wastage mitigation methods by the sector’s professionals across the globe, while accounting for local, national and regional conditions. Finally, state and local authorities’ input regarding the need to support hotel food waste mitigation in Cyprus should be obtained to assess whether claims made by hotel sector professionals about the local and national government being passive are justified.

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