

Article

Sustainable Production and Consumption of Food. Mise-en-Place Circular Economy Policies and Waste Management Practices in Tourism Cities

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Abstract: Although previous researchers have explored the circular economy practices of different businesses in various contexts, currently, there are still a few contributions that are focused on the sustainable preparation and consumption of food in the tourism and hospitality industry context. Hence, this paper sheds light on case studies from hotels, restaurants, and cafes that are located in urban tourist destinations. This research suggests that catering businesses can implement a number of responsible initiatives by introducing preventative measures and recycling practices to curb food loss and the generation of waste. In conclusion, this contribution implies that there is scope for regulatory authorities and policymakers to encourage hospitality practitioners to engage in circular economy approaches and to incentivize them to minimize food waste in tourism cities.

Keywords: circular economy; hospitality; sustainable production; sustainable consumption; food waste; surplus food



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1. Introduction

Circular economy systems are intended to improve operational efficiencies and to reduce waste in production processes and during the products' lives [1–4]. Several theoretical underpinnings have reported that efficient monitoring and control procedures can be implemented in all stages of production, distribution, and consumption [5–7] in order to minimize the cost of dealing with externalities including pollution and emissions [8,9]. The basic philosophy behind such closed loop systems is to discourage manufacturers as well as customers from generating waste and to entice them to re-utilize waste as a sustainable resource [10–12]. Thus, the circular economy is a regenerative system that minimizes resource input, waste, emissions, and energy leakages through closed loop systems [13]. Businesses and consumers can reduce the use of virgin resources, materials, and energy inputs [14,15]. In fact, circular economy researchers have confirmed that the reliance on raw materials can be diminished if resources are reused, restored, refurbished, and/or recycled [16–18].

Lately, several intergovernmental organizations are increasingly formulating sustainable consumption and production policies to encourage businesses and industry to shift from linear economy approaches that are built on the premise of 'take–make–consume and dispose' actions to sustainable circular economy systems [19–25]. The European Green Deal provides an action plan to boost the efficient utilization of resources by moving to a clean circular economy to restore biodiversity and cut pollution [26–28]. The plan specifies that European economies ought to invest in environmentally friendly technologies to improve global environmental standards for sustainable cities [29,30]. Its Farm-to-Fork (F2F) Strategy is at the heart of the European Green Deal [31,32]. In sum, it is intended to safeguard food security and to ensure an equitable access to healthy diets for all European citizens [33,34].

Currently, food systems account for nearly one-third of global greenhouse gas (GHG) emissions, demand large amounts of natural resources, and result in the loss of biodiversity [35]. The World Wildlife Fund has predicted that between six to eight percent of global greenhouse gas emissions could be eliminated if food waste was brought to zero [36]. The EU generates around 88 million tons of food waste, with associated costs hovering around EUR 143 billion [37]. Notwithstanding, an estimated 20% of the total food produced is lost or wasted, whilst 33 million citizens cannot afford a quality meal every second day [38].

The EU's F2F strategy aims to accelerate the transition to a sustainable food system that mitigates climate change, reverses the loss of biodiversity, and ensures the provision of affordable food for all citizens, whilst promoting fair trade and fostering the competitiveness of the EU's supply sector [13]. This strategy is also congruent with the EU's environmental sustainability policies [28,39] and with its latest circular economy plan for a cleaner and more competitive Europe [19].

Previous research has investigated various circular economy approaches in different businesses and industries [4,27,40,41]. However, there is still a gap in the academic literature that is focused on the hospitality industry's sustainable innovations and recycling practices that are meant to reduce food loss and the accumulation of food waste [10,13,15]. Food and beverage operations will inevitably continue generating waste that may (or may not) result in negative effects on the natural environment and on the long-term sustainability of biospheres [2,22,24].

In this light, the underlying objective of this contribution is to raise awareness of circular economy practices in tourism cities. It relied on an inductive content analysis methodology to investigate sustainable food production and consumption as well as waste management practices of hospitality businesses. The data for this research was gathered through academic and non-academic sources that promoted the responsible initiatives of a number of hotels and restaurants. Hence, it sheds light on case studies (that were drawn from real catering businesses) and discusses their sustainable food preparation behaviors and waste minimization strategies. In conclusion, this paper puts forward key proposals to hospitality practitioners.

2. Responsible Practices to Prevent Food Loss and Waste

According to the U.S. Food and Drug Administration, between thirty and forty percent of the nation's food supply goes to waste every year [42]. About forty percent of this food comes from hospitality businesses [43]. This adds up to GBP 133 billion or USD 161 billion worth of food that ends in the land fill. The Association of Hotels, Restaurants, and Cafes in Europe (HOTREC) and the European Federation of Food Banks (FEBA) are continuously educating stakeholders on ways of how to reduce food loss and waste from the hospitality industry's supply chains [44]. HOTREC promotes responsible food production and consumption behaviors among its members, including small and medium sized enterprises (SMEs). Its members are encouraged to prevent food wastage by using surplus food, donating food to people in need, re-using non-edible food waste to create compost for gardens, or by transforming it into methane gas (which is used to generate energy) [43].

In this day and age, hospitality businesses, including hotels, restaurants, and cafes are expected to follow responsible practices and to engage in sustainable production and consumption behaviors to reduce food waste [45–48]. HOTREC has developed a food waste hierarchy to help practitioners tackle food waste. In sum, this policy document urges them to (i) prevent wasting food, (ii) redirect unused food to feed people in need, (iii) redirect food to feed livestock or for industrial utilization, and (iv) recover food waste through composting or methanation processes.

The following section presents a number of good practices and sustainability initiatives that have been taken on board by responsible hospitality businesses.

2.1. Creating 'Sustainable' Menus

Restaurant patrons are increasingly favoring the quality and presentation of food rather than abundant portions [49]. Hence, there is scope for food and beverage servers to communicate with clients to better understand their expectations. This way, they can adjust their portions according to their customers' demands and avoid the generation of waste. In a similar vein, buffet consumers may be encouraged to limit the amount of food in their meal trays. For instance, in 2019, Hilton introduced its "no-waste" catering menus and implemented its thoughtfully designed buffet presentations [50]. The hospitality company has streamlined its menus and reduced its over-production practices. It claimed that the production of less food requires an integrated approach involving different departments, including hotel management, food preparation and production, food and beverage services, and purchasing, among others.

Customers may be reminded that they can take away their leftover food in doggy bags or food-boxes. Recently, a number of hospitality establishments in Denmark, France, Italy, Portugal, and Scotland were providing waste prevention kits that are composed of containers for leftover food and plastic bags to carry these containers and bottles. They are increasingly urging customers to take their leftovers back home with them [51].

Italian hotels (in Florence) invited their guests to use small plates that contained reduced portions of food, to minimize waste, from their buffets. A waste prevention campaign, entitled "Conscious Consumption, Respect the Environment" that was organized in Oeiras (Lisbon, Portugal) recommended that, during buffets, customers should strictly pick a minimum number of food items that would satisfy their appetite and nutritional requirements [51]. If at the end of the meal, their tray was empty (and without leftovers), consumers would receive a poker chip (i.e., equivalent to 10 g of nonperishable foods) that would be donated to charitable institutions.

In sum, restaurant owners should consider having less items on their menus. Fewer items would necessitate less inventory in their kitchens. They could use the same ingredients in different recipes or promote their menu of the day. Such menus may include those products that are about to expire, bearing in mind that certain foods such as fruits and vegetables are perishable items, hence, they have to be consumed in a few days.

2.2. Local Procurement of Products

Hospitality businesses ought to use fresh, seasonal products that are usually available at reasonable costs. It is in their interest to order organic products (e.g., from certified farms) that meet appropriate quality standards. The shelf-life of sensitive products such as fruits and vegetables is usually shorter than packaged goods. Hence, food and beverage preparers have to use them before their decay. Therefore, hospitality businesses ought to establish flexible arrangements with local suppliers and distributors to adjust their ordered quantities according to their expected number of customers (if possible) [44]. In 2019, Hilton reported that some of its properties reduced food waste by purchasing locally sourced, seasonal products, by working closely with "imperfect" suppliers, and by using the whole product wherever possible.

2.3. Just-In-Time Purchasing Systems and Responsible Inventory Practices

Restaurants need to store their food ingredients in appropriate conditions. They have to monitor their inventory on a regular basis to reduce spoilage and prevent waste. For example, sensitive products such as fruits and vegetable can dehydrate if they are stored in damaged packaging. Alternatively, they may rot if they are mishandled during transportation. Some items can be stored in deep-freezing conditions [52] and in vacuum packaging to extend their shelf-life [53]. Restaurant owner-managers should always respect health and safety standards by controlling the shelf-life of their products and by labelling items in their cold storage facilities to ensure that they know the expiry date of every product and ingredient.

Moreover, they are expected to comply with relevant hygienic practices when handling fresh products such as dairy products, meat, and poultry, among other items [54]. In this case, they should use first-in-first-out (FIFO) rotating systems to minimize the generation of waste from expired food. In addition, hospitality businesses may implement just-in-time ordering systems to increase efficiency. For example, they can receive ingredients (from their suppliers) only as they are needed for production, not ahead of time.

2.4. Reusing and Recycling Surplus Food

Food can deteriorate quickly and can become waste due to specific health and safety regulations and hygiene standards. Restaurants should try to use edible food products that are close to expire. The leftovers from cooking can be re-used to make new products. For example, meat trimmings can be reused to make soup stock, et cetera.

Very often, food and beverage service providers prepare excessive food, particularly in buffet settings. Their oversupply may be triggered for aesthetic reasons, or by their consumers' eating habits. Hence, restaurant managers could adopt a series of measures to reduce waste. For instance, servers can regularly check their customers to better align their supply according to demand. They may decide not to re-fill the items of their buffet towards the end of their restaurant service.

Hospitality employees should ensure that they are packaging their surplus food and beverages well in order to increase their shelf-life [55]. The use of cans or smaller bottles can be more appropriate than large containers. The utilization of coffee machines and water dispensers are more sustainable than thermoses of coffee and big bottles.

There are a number of case studies of good practices, where hotels were capable of reducing food waste from their buffets and restaurants. For instance, the (European) Urban Waste project that was focused on waste management strategies of hospitality businesses was adopted across 12 European countries [51]. It involved 4 hotels in Copenhagen, 128 restaurants in Florence, 3 hotels in Kavala, 4 hotels (with 1 hotel school) in Lisbon, and 4 hotels in Tenerife. Its objectives were threefold: Firstly, the project aimed to reduce the amount of municipal waste. Secondly, it involved the collection of waste for recycling purposes. Thirdly, it raised awareness on eco-innovative measures and responsible practices among hospitality practitioners. The project partners organized capacity building and guidelines for policymakers, as well as training sessions among other stakeholders, including employees and customers, to encourage them to engage in sustainable behaviors [56–58].

Hospitality businesses can identify cost saving opportunities if they reduce food loss and waste. For example, Hilton has recently expanded its food waste reduction program across its North American properties. The global business asserted that this program is part of its strategy to halve the generation of food waste from its hotels by 2030. Its waste management program has followed WWF and American Hotel and Lodging Association's Hotel Kitchen Toolkit. These organizations provided guidelines on the responsible consumption of food and on the disposal of leftovers [50]. Similarly, Hyatt is using this Toolkit at its 875 hotels around the world. Each hotel is expected to formulate a food waste management plan that is consistent with its corporate goals to reduce food waste. Moreover, Marriott, the largest hotel company in the world, tested the Toolkit at 10 of its properties. The global giant has committed itself to halving its food waste by 2025.

Recently, Copenhagen, Lisbon, and Tenerife hotels have used a food tracking device to monitor the volumes and types of food waste that was disposed of by their restaurants. Other laudable initiatives included running a competition to motivate kitchen employees to reduce their food waste. These competitions were organized in Copenhagen hotels (which belonged to the Guldsmeden group). In Lisbon, a food waste prevention campaign in two hotels has led them to diminish their organic waste by 7% and 25%, respectively. In Tenerife, three hotels reduced it by 29%, 43%, and 46% in a time span of 5 months. The Urban Waste project's listed waste prevention measures have resulted in reduced waste streams in the hospitality and accommodation sectors. Another campaign, entitled the "Menu Dose

Certa" (Right Portion Menu) initiative, which was implemented by the Intermunicipal Waste Management company of Greater Porto (LIPOR) in collaboration with 11 restaurants and 29 canteens, has resulted in a reduction of kitchen waste by 0.34 kg/meal/year and customer waste flow by 2.79 kg/meal/year [51].

2.5. Utilizing A Sharing Economy Platform to Curb Food Waste

Hospitality businesses may consider minimizing their food loss and waste to reduce their operating costs. However, it may prove hard for them to completely avoid the overproduction of food in their restaurants. The oversupply of food can be attributed to a number of events, including no-shows and perishable inventory that is not consumed before the closure of the establishment, and so forth. Restaurant managers may find themselves in a situation where they have surplus food that is not consumed by customers. Very often, hospitality businesses have to dispose of surplus food if it is not served and eaten in time, before it goes bad and gets spoiled. Similarly, grocery products can rot on their shelves and will have to be thrown away before their expiration dates.

Currently, a number of innovative businesses are employing sharing economy models to address this challenging issue. ResQ is a good example of a sustainable enterprise that aims to reduce the proliferation of waste from the surplus food that is generated by hotels, restaurants, and cafes. This company is a viable going concern as it operates its business in a profitable manner. It developed a mobile application (app) that is operated in Finland as well as in parts of Germany, Poland, and Sweden.

A number of popular hospitality companies, including Hilton, Crown Plaza, and Holiday Inn, among others, are using this app. This innovative app enables consumers to search for surplus food, including meals and ready-to-eat snacks, as well as large bags of food from nearby hospitality businesses. Their query lists the suppliers of food and shares their location through the app's virtual maps. Hence, customers can order discounted food and pick it up from catering outlets.

In sum, the sharing economy is providing a win-win situation for hospitality businesses as well as for their customers. Apps such as ResQ, among others, are reducing the likelihood that surplus food ends up in trash bins if it is not consumed in time. Moreover, they are increasing the hospitality businesses' revenue streams by bringing in customers who are willing to pay for their perishable food items. In fact, in this case, many restaurants increased their revenues by 2–6% [59].

2.6. Donating Surplus Food to Charities and Food Banks

Hotels, restaurants, and cafes may consider donating surplus food to charities and food banks. There are many non-profit and social organizations in different contexts that are collecting leftover food (including prepared food) to distribute it to vulnerable citizens. Of course, each country has its own legal framework and may require that the donation of food complies with specific health/safety regulations.

Different jurisdictions are enacting relevant legislation relating to food safety standards. For instance, the EU Commission has developed its food donation guidelines for donors and receivers of food surplus [60]. It has also published regulations and reports on food hygiene. In addition, many member states have published their own national guidelines [61]. Similarly, the Federal Drug Administration (FDA) in the United States of America (USA) is transforming the nation's food safety system by introducing preventative measures. The FDA has finalized seven major rules in its Food Safety Management Act (FSMA) to ensure that the supply of food is safe for both human and animal consumption [62]. Therefore, hospitality businesses are expected to follow their respective countries' regulatory instruments and principles on food safety before donating their surplus food to charities [60,62].

Every year, international hotel chains are donating tons of food to charities and food banks. Alternatively, they compost food that cannot be donated. For instance, Hyatt has seen a fifty percent increase in its number of hotels that are donating surplus food,

and Hilton claims that it is saving approximately USD 7000 per month in waste hauling fees [50].

Other multi-national businesses, including Carlson Hotels Worldwide, Radisson Hotels and Resorts, Marriott International, and Fairmont Hotels and Resorts are donating surplus food to community projects such as homeless shelters, orphanages, homes for the elderly, and drug rehabilitation centers [63].

The InterContinental Hotels Group (IHG), one of the world's leading hotel companies, announced that it is pledging its support to European Food Banks and other food provision charities, including during the COVID-19 crisis, to ensure that these non-governmental organizations have access to necessary funds, training, and resources. IHG claims that it donates food to different communities across 70 countries. Its long-standing 'True Hospitality for Good' charitable partners include the British Red Cross, through its Disaster Relief Alliance membership, CARE International, which provides personal, protective equipment (PPE) in developing markets, and China Red Cross. Furthermore, it collaborated with 'No Kid Hungry' in the US, 'Trussell Trust' in the UK, the 'Global Foodbanking Network' (GFN), and the 'European Food Banks Federation' (FEBA), among others [64].

Other tourism companies, including Costa Croisières, have launched a food surplus donation initiative in collaboration with the European Food Banks Federation in 11 of the company's ports of call including Marseille, Pointe-à-Pitre, Fort-de-France, and Saint-Denis de la Réunion. The cruising company is donating meals (that are not served to passengers) to French Food Banks. The surplus food is collected, placed in aluminum trays according to strict sanitary procedures, sealed, labelled for traceability purposes, and stored in on-board refrigerators. Every Sunday, these dishes are unloaded and donated to the Bouches-du-Rhône Food Bank, who will in turn distribute them to the Salvation Army [65].

In Italy, the "Good Samaritan Law" protects restaurants, bars, and buffets from civil and criminal liability if a recipient would get ill from the consumption of donated food. In this case, donors may be considered guilty if they are accused of negligence or intentional misconduct (such as donating contaminated food). HOTREC, in conjunction with the European Federation of Food Banks (FEBA), has formulated its guidelines to help hospitality establishments donate their surplus food to those in need. In sum, HOTREC (2017) specified that hospitality businesses should consider the following: (i) entrust a 'responsible person' to be in charge of food donations, (ii) select a reliable partner for donations, (iii) conclude a formal partnership with a partner organization, (iv) identify which foods will be donated, (v) store the food to be donated, (vi) transfer the food to the partner organization, (vii) keep a track record of the donated food and provide key information, (viii) tax benefits, (ix) consumer engagement, and (x) quality assurance.

This document recommended that hospitality businesses should formalize a partnership agreement with the recipients of their donations (even for ad-hoc/irregular donations). This agreement ought to clarify the tasks and responsibilities of the donor (in terms of preparation and maintenance of food, until the point of takeover) and of the recipient (this may include information on storage conditions of transport and details on serving/delivery to the final beneficiaries). The document should clearly specify the liability in terms of health and safety, before and after the food is transferred from one party to the other. It has to identify which foods can (or cannot) be donated.

There is scope in financial terms for hospitality businesses to donate surplus food items that are about to expire. It is in their interest to keep records of each donation to ensure the full traceability of food products and for possible tax deduction purposes, where applicable. While there are countries where VAT has to be paid for donations (which is based on the actual value of the surplus food), there are others where VAT is either exempt or is close to zero. Some EU countries have implemented a tax credit system or deductions for donated food in order to encourage restaurants to donate good food instead of throwing it away. For instance, the French and Spanish governments are incentivizing businesses to

donate food to food banks and charities. France offers a 60% tax credit (and Spain offers 35%) of the net book value of donated food.

These incentives are intended to offset certain costs relating to the storage, transportation, and distribution of surplus food. Food and beverage businesses are encouraged to donate surplus (edible) food rather than to send it to the landfill. For example, French restaurants have to pay out EUR 100 for landfill taxes to dispose of a ton of waste. If they accumulate EUR 1000 worth of food, the total disposal cost would amount to EUR 1100. On the other hand, if establishments donate food rather than waste it, they could save the landfill costs. At the same time, they can benefit from a tax credit of EUR 600 (in France). Hence, hospitality business would lose EUR 400 rather than EUR 1100 to dispose of surplus food.

There are several laudable practices in different parts of Europe. For instance, the “Portuguese Federation of Food Banks Against Hunger” recovers food surpluses from hospitality businesses. This non-governmental organization mobilizes individuals and companies to voluntarily address food shortages in society. In 2020, this federation distributed almost 30 thousand tons of edible food (with an estimated value of EUR 41.2 million), and an average movement of 165 tons per business day [66]. Such food banks, including this federation, will not donate expired and/or spoiled food. The donated food needs to comply with relevant food hygiene and safety legislation as it should be appropriate for human consumption [60–62].

2.7. Recycling Inedible Food

Hospitality businesses cannot donate food that has passed its expiration date, or if it has spoiled or decayed. Such food is not safe for human consumption. However, it can be recycled for animal feed [67], turned into compost [68], and/or transformed into energy through methanation [69,70]. An EU-funded project, entitled; ‘Sustainable production of functional and safe feed from food waste’ (NOSHAN) has recently confirmed that food waste can be converted into animal feed at low cost, and with low energy consumption levels [71,72].

Food waste can be transformed into high quality compost for trees and plants. Many hotels and restaurants are increasingly utilizing compost bins that can facilitate the degradation of organic waste and turn it into compost for their gardens. For instance, the Tower Hotel in Perthshire (Scotland) are recycling their organic waste (i.e., vegetable and fruit peelings, eggshells, coffee bags, etc.) on site and turning it into a fertilizer for gardens. The French Metropole “Nice Côte d’Azur” (MNCA) is using a thermal dryer that transforms food residues into dry, fertilizing organic matter [51].

Other hospitality establishments, such as the Business Hotel Bratislava in Slovakia, is using an electric composting system to turn biodegradable waste into compost. Usually, these appliances are very small and do not take much space. More importantly, they do not produce odors or leakages. Although such systems will require an electricity supply, they can be installed in kitchens or in maintenance rooms. They do not require labor intensive activities and still produce a natural fertilizer (out of food waste).

Apart from food waste from the kitchen, many hotel properties may also have green waste from their gardens and green roofs such as tree cuttings, plant leaves, and dead plants that can be mixed with food waste and composted through one of the mentioned composters [10]. Conversely, they can treat organic waste through worm composting bins. In this case, the bins would have earthworms that digest food waste and convert it into vermicompost. The installation of composting bins in hotels and restaurants can contribute to the reduction of food waste, thereby reducing or avoiding the costs that will be required to treat residual waste. The generated compost can be used as a fertilizer in the hotels’ properties or in urban gardens.

The production of compost may translate into significant cost savings and can even create revenue opportunities for hospitality businesses. Restaurants can finance their responsible investments in these devices by selling their produced compost to farmers,

who may use it for agricultural purposes, if they are approved through relevant national authorities' quality control processes [15].

3. Discussion

This paper suggests that hospitality businesses can implement a number of responsible practices. The very first step for them is to develop 'sustainable' menus. The restaurants' menus can offer a choice of different portion sizes to satisfy the requirements of different customers. They may feature fewer items in their menus to operate their business with a reduced inventory of food products to decrease storage costs and minimize waste and spoilage. It is in the interest of restaurant owner-managers to procure fresh ingredients from local businesses including farmers, bakers, butchers, et cetera, to ensure that they are preparing good food for their valued customers. Local products, including organic items such as fruit and vegetables, will have a longer shelf-life than imported ones.

The hospitality businesses ought to forge close relationships with dependable, local suppliers to implement just-in-time purchasing systems. There is scope for them to purchase regularly and in smaller quantities to reduce the probabilities of food spoilage and dehydration. They are expected to continuously monitor the expiration dates of food items and ingredients to minimize waste and to respect relevant hygienic standards. Owner-managers may apply the first-expired-first-out (FEFO) principles in their kitchens, to avoid any stockouts. Moreover, they can use food tracking devices to identify the types of food waste they are generating.

Their monitoring and control of food waste should be carried out on a day-to-day basis to increase their efficiencies and cost savings. Practitioners may keep a record of their waste in a spreadsheet. They can measure the quantity of organic waste that is generated from their premises. They could include details such as the dates (and times) of events, which ingredients or recipes were wasted, the name of the employee(s) who was (or were) responsible for the waste, et cetera. Furthermore, practitioners can estimate the composition of their organic waste and identify whether it is derived from vegetables, bread/pasta, specific meats, etc. This will allow them to make adjustments in their food menus (if possible).

Such food tracking may also help hospitality business detect irresponsible behaviors in their kitchens and to minimize food waste from their properties. It may indicate that certain employees are not engaging in responsible food preparation behaviors. There is scope for hospitality businesses to train their human resources, at all levels, particularly new employees, on circular economy approaches [73,74]. In this way, they will be in a better position to improve their efficiencies in terms of reducing, reusing, and recycling resources, and responsible waste disposal practices. They have to be supported and educated on the best practices to ensure that they are improving the (economic) sustainability of their businesses' food and beverage operations whilst minimizing their impact on the natural environment [75–77]. Table 1 illustrates the responsible behaviors that can be implemented by hospitality businesses to reduce food loss and the generation of waste from their premises:

This research has shed light on a number of laudable circular economy initiatives that were drawn from the hospitality industry. It also made reference to a sustainable enterprise that utilizes a sharing economy platform that links consumers with hospitality service providers. Mobile users can purchase surplus food from hotels, restaurants, and cafes at a discount. At the same time, the app enables these catering companies to create revenue out of perishable food and to minimize their environmental footprint by reducing their waste. Moreover, it reported that these businesses can benefit from tax deductions and credit systems, in different contexts, if they donate surplus (edible) food to charities and food banks. Alternatively, if the food is contaminated or decayed, it can be monetized if it is collected and turned to compost, transformed into energy through methanation processes, or converted into animal feed (if it complies with relevant legislation on the health and safety of animals).

Table 1. Preventative measures and recycling practices for a sustainable value chain of food.

Preventative measures	Creating ‘sustainable’ menus	
	Responsible procurement of food items and ingredients	
	Responsible inventory practices	
	Reducing portions	
Recycling practices	Recycling surplus food	Utilizing sharing economy platforms
		Donating surplus food to charities and food banks
	Recycling food waste	Animal feed
		Composting
		Methanation processes

4. Conclusions and Implications

The implementation and execution of the circular economy’s closed loop systems ought to be promoted through different marketing channels. Hotels and restaurants can use marketing communications through different media to raise awareness on how they are capable of generating less waste [78]. They should promote sustainable production and consumption behaviors through different media outlets, including traditional and digital channels [78–81].

Hospitality businesses’ responsible initiatives can raise their profile among different stakeholders, including customers and suppliers, among others [82,83]. The customers will probably appreciate the hospitality businesses’ efforts to reduce their impact to the natural environment. Some of the hotels’ (and restaurants’) sustainability measures are dependent on the active commitment of their patrons. Therefore, it is very important for them to raise awareness of their waste prevention campaigns and on their environmental achievements so that they may feel part of the catering companies’ responsible initiatives. This way, they become key participants in the reduction of generated waste. Hence, businesses can educate customers on responsible consumption behaviors to help them in their endeavors to curb food loss and the generation of unnecessary waste [84,85]. Food and beverage servers ought to engage in conversations with their clients to better understand their food requirements.

In a similar vein, this research suggests that it is in the interest of hospitality businesses to forge closer relationships with their suppliers, including farmers and other retailers, to implement responsible inventory management systems and just-in-time purchasing. Suppliers must continuously be informed and updated on their procurement policies. Their ongoing communications may facilitate collaborative practices that may translate to positive outcomes, including the sourcing of better-quality products with extended lifecycles and longer expiry dates.

This paper has reported on various preventative measures and recycling practices that may be taken on board by hospitality practitioners and their stakeholders in order to reduce food waste and its detrimental effect on our natural environment and biospheres. There is scope for trade unions and industry associations in tourism and hospitality to promote responsible behaviors among their members.

Notwithstanding, regulatory authorities and their policymakers can encourage hospitality practitioners to invest in environmentally friendly systems to minimize their food loss and waste. They can offer them financial incentives such as tax deductions or exemptions when they donate surplus food. Alternatively, governments can support them by providing adequate infrastructures and resources, including on-site composting facilities and/or methanation processes that are aimed to minimize the accumulation of food waste that finishes in landfill. Such responsible investments will ultimately result in a sustainable value chain in tourism cities, as circular economy policies and waste management

practices will add value to the hospitality businesses, to the environment, and to society at large [86,87].

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